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26 July 1978

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BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 92

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26 July 1978

# USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

## BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 92

This serial publication contains abstracts of articles and news items from USSR and Eastern Europe scientific and technical journals on the specific subjects reflected in the table of contents.

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BIOMEDICAL SCIENCES

Agrotechnology

USSR

UDC 632.931:633.11

CROP ROTATION AND THE DEVELOPMENT OF ROOT ROT

Moscow ZASHCHITA RASTENIY in Russian No 4, 1978 p 31

MIKHAYLINA, N. I., candidate of agricultural sciences, Southeastern Agricultural Scientific Research Institute

[Abstract] Conditions responsible for root rot affecting spring wheat in the Volga region are reviewed. Presently, approximately 30-40% of the crop is diseased and 15-20% of the grain is lost. An analysis of the various agricultural factors has shown that proper crop rotation and highly sophisticated agrotechnology can be used to markedly reduce the incidence and losses due to root rot. Especially effective precursor crops are winter wheat and corn planted for silage, while planting of spring wheat twice in a row should be avoided.

USSR

AGROTECHNOLOGY AND SPRING WHEAT DISEASES

Moscow ZASHCHITA RASTENIY in Russian No 4, 1978 pp 31-32

SAF'YANOV, S. P., candidate of biological sciences, Volgograd Agricultural Experimental Station

[Abstract] A brief review is provided of the various diseases of spring wheat in the Lower Volga region under conditions of dry farming. Use of the latest agricultural technology affecting all aspects of spring wheat cultivation invariably has a positive effect and markedly lowers the incidence of the various diseases. Implementation of the latest knowledge has resulted in the harvesting of an additional 880 quintals of grain on 200 hectares of the Lenin kolkhoz in the Novoanninskiy rayon in 1976, which represented an additional income of 5142 rubles. In 1977 in the Gorodishchenskiy rayon an additional 4.7 thousand quintals were harvested from 1.5 thousand hectares which yielded an additional income of 32,000 rubles.

USSR

UDC 631.577.486

# BIOLOGICAL PRODUCTIVITY OF IRRIGATED CROPS

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA in Russian No 1, 1978 pp 10-14  
manuscript received 30 Mar 77

YEVDOKIMOVA, T. I. and NOVOKSHONOVA, L. I., Department of Pedology

[Abstract] Investigations were conducted on the effects of climatic conditions, particularly the modifications introduced by irrigation, on the biological characteristics and yields of Bezostaya-1 and Kavkaz winter wheats and alfalfa cultivated in the Ovidiyeopol'skiy rayon in the Odessa oblast. Evaluation of the results obtained in 1975 and 1976 demonstrated that the greater rainfall of 1976 led to increased harvests of both wheat varieties, but that Bezostaya-1 was much more responsive to higher soil moisture content than Kavkaz. The productivity coefficient increased from 1.6 in 1975 to 3.6-3.8 in 1976. The green phytomass yields of alfalfa were greater on irrigated than on non-irrigated fields, although in both cases maximum harvests were obtained during the 3rd year (and even the 4th for irrigated fields), reaching 60 quintals/hectare under irrigation. References 3 (Russian).

USSR

UDC 633.15:636.085.52

# PLANNING HIGH YIELDS OF SILAGE CORN

Moscow DOKLADY VASKhNIL in Russian No 3, Mar 78 pp 11-13 manuscript received 10 Mar 77

PROSKURA, I. P., doctor of agricultural sciences, and candidates of agricultural sciences MEREZHKO, N. M., and KVITKO, G. P., Ukrainian Scientific Research Feed Institute

[Abstract] An analysis was made of the factors which lead to high harvests of silage corn (Dneprovskiy-247-MV) under the conditions of the central Ukrainian lesosteppe area. The results showed that optimization of the factors influencing plant viability (fertilizers, manner of planting, planting density, etc.) results in marked increase in the efficiency with which photosynthetically active radiation is utilized and, hence, in the crop yield. During the years of study (1974-1975) the highest harvests of dry substance (157.5 quintals/ha) silage mass (761.0 quintals/ha), and raw protein (16.7 quintals/ha) were obtained when the distance between rows was 45 cm in combination with a planting density of 120,000/ha and 20 tons of  $N_{203}P_{102}K_{232}$  fertilizer. References 4 (Russian).

USSR

UDC 615.038

PHARMACOSOME CONCEPT--A NEW THERAPUETIC APPROACH

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian No 4, 1978 pp 18-22  
manuscript received 22 Apr 77

RAYKHMAN, L. M., MOSHKOVSKIY, YU. SH. and PIRUZYAN, L. A., Scientific Research Institute for Biological Testing of Chemical Compounds, Moscow Oblast

[Abstract] The pharmacosome concept is advanced for increasing the therapeutic specificity (and effectiveness) of drugs. The pharmacosome is described as a supramolecular entity possessing affinity for certain cells or tissues into which a drug is incorporated for delivery to the target site. In order to be effective a pharmacosome should incorporate 3 basic components: effector(s) (i.e., drugs), affinity agents (agents responsible for homing in on a target, e.g., tissue-specific antibodies, ligands for cell receptors, lectins, substrates for cell surface enzymes [glycosyltransferase]), and penetrating factors (factors responsible for introducing pharmacosome contents into the target cell, e.g., phospholipid vesicles that fuse with cell membranes). Figure 1; references 27: 3 Russian, 24 Western.

USSR

UDC 577.156.3.02

ENZYME IMMOBILIZATION ON BIOCOMPATIBLE CARRIERS. MODIFICATION OF ALPHA-CHYMOTRYPSIN BY HEPARIN

Moscow BIOORGANICHESKAYA KHIMIYA in Russian No 4, 1978 pp 566-568 manuscript received 31 Oct 77

TORCHILIN, V. P., All-Union Cardiology Scientific Center, Academy of Medical Sciences USSR, Moscow

[Abstract] The free carboxyl groups of heparin were employed for covalent binding of alpha-chymotrypsin (CT) via its lysine epsilon amino groups following activation with water soluble carbodiimide. Chromatography of the reaction mixture on Sephadex G-75 resulted in the isolation of a heparin-CT fraction containing 100 mg CT per 1 g of the carrier. Subsequent studies showed greater stability of the immobilized enzyme vs. heat inactivation (ca. 80% retained activity after 6 h at 37°, pH 8.2, in comparison with ca. 3% retention of activity for native CT), and no significant changes in enzymatic activity. The latter is particularly important with respect to the potential use of the heparin-CT complex as a thrombolytic agent. References 5: 2 Russian, 3 Western.

USSR

UDC 616.12-072:007.5

WAYS OF INCREASING THE INFORMATION CONTENT IN AUTOMATIC PROCESSING OF  
INSTRUMENT DATA IN CARDIOLOGY

Moscow KARDIOLOGIYA in Russian No 2, 1978 pp 14-20 manuscript received 4  
Apr 77

MATUSOVA, A. P., FILIPPOV, V. G., KRASNOSHCHIEKOV, I. P., GLADKOV, V. V.,  
KHALMANOV, V. V., KHAYMOVICH, M. M., ARATEN, S. M., POSTOYEV, V. V., UTROBIN,  
V. A., SAMARTSEVA, T. F., and OVSYANNIKOV, V. YA., Department of Faculty  
Therapy (in charge, Prof. A. P. Matusova) and Department of Operative Surgery  
(in charge, Prof. I. F. Matyushin), Gor'kiy Medical Institute

[Abstract] New algorithms are proposed for analysis of the sinus rhythm and  
the left-ventricle posterior wall cardogram. It is significant that the in-  
put methods and the information-coding algorithms permit the data to be ana-  
lyzed within a real-time frame. Clinically informative signs have been as-  
certained: the number of R-R interval classes, the distance between the cen-  
ters of the classes, distribution uniformity of the R-R intervals with re-  
spect to the classes, and the value of the doppler-cardiogram spectrum har-  
monics I/II ratio. The possibility of the use of these signs in automatic  
data-processing systems in the examination of ischemic heart-disease patients  
is shown. Figures 3; references 11: 7 Russian, 1 Polish, 3 Western.

USSR

UDC 612.172.4

SOME BIOELECTRIC ACTIVITY PARAMETERS OF THE HEART CONDUCTING SYSTEM AMONG  
VIRTUALLY HEALTHY INDIVIDUALS

Moscow KARDIOLOGIYA in Russian No 2, 1978 pp 26-34 manuscript received 11  
May 77

RUGENYUS, YU., LAUTSYAVICHYUS, A., Department of Hospital Therapy (in charge,  
Prof L. Lautsyavichyus) of the Vil'nyus University imeni V. Kapsukas and the  
Institute of Experimental and Clinical Medicine (director, Prof A. Matulis),  
Ministry of Health Lithuanian SSR

[Abstract] Intracardiac conduction was studied on the basis of the concep-  
tion of the atrial spike potentials. Intracavitary electrograms from the  
right atrium, the zone of the bundle of His, and the esophagus were recorded  
from 110 persons, among 35 of whom no heart pathology was found to be present;  
these were accepted as the control indices. It was found that the sinoatrial  
transmission time comprises  $20 \pm 6$  millisecc, the distribution time of the exci-  
tation of internodal conduction along the auricular passages  $12 \pm 9$  millisecc,  
the physiological asynchronism of the electrical stimulation of both auricles  
is  $38 \pm 11$  millisecc, the distribution time of excitation through the atrioven-  
tricular node is  $75 \pm 17$  millisecc, the time for conducting excitation via the



System of His's bundle to the ventricle musculature is 42+6 millisec. Comprehensive study of the phenomenon of bioelectric activation of the atria and the His's bundle system significantly widens the possibilities of selective intracardiac conduction disorders at various levels of stimulation propagation. Figures 5; references 34: 10 Russian, 24 Western.

USSR

UDC 615.471.03:616.831-073.97

#### FOUR CHANNEL ELECTROENCEPHALOGRAPHIC AMPLIFIER WITH INTEGRATED MICROCIRCUITS

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 1, Jan/Feb 78 pp 16-19 manuscript received 10 May 76

ZHURAVLEV, B. V., OZHOGIN, M. A., SIMAKOV, A. B., STEPANENKO, I. P., and SUDAKOV, K. B., Moscow Engineering-Physical Institute

[Abstract] Present EEGS are large and immobile and cannot be used on moving subjects. A 4-channel amplifier, using integrated microcircuits was developed and successfully tested on animals at the Institute of Normal Physiology. A circuit diagram for the unit, consisting of a pre-amplifier, a main amplifier, calibrator, high and low frequency filters, and power packs, and for the DC integrated circuit amplifier, consisting of 30 transistors, are presented. The amplifier is sensitive to low frequency noises. At a conversion frequency of 3 kilohertz noise voltage amounts to 2.5 mv. At the same frequency input, resistance is 100 MOhms. Two differential cascades ensure a coefficient of amplification of the differential signal of 15. The main amplifier has a K1UT531 amplifier, and a K1US671 low frequency amplifier. Figures 5; references 3 (Russian).

USSR

UDC 576.858.75.097.2.095.5

EVOLUTION OF H3 ANTIGEN IN INFLUENZA VIRUSES ISOLATED IN 1968-1976

Moscow VOPROSY VIRUSOLOGII in Russian No 1, Jan/Feb 78 pp 59-63 manuscript received 13 Apr 77

ROVNOVA, Z. I., KOSYAKOV, P. N., DEMIDOVA, S. A., I. SAYEVA, YE. I., PLATONOVA, A. L., POLYAKOVA, T. G., and BALNOKINA, S. I., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

[Abstract] The authors have already shown that type A influenza viruses isolated in various epidemic periods from 1968-1974 contained three antigenic determinants in their hemagglutinin composition. One, H3, was common to all viruses, while variants of the approximate isolation time each had one similar antigen. Evolutionary change in the type A virus involved appearance in the hemagglutinin of one or two new specific antigenic determinants and retention of some common antigens. This article reports preparation of a monospecific non-inhibitory serum to one antigenic determinant of H3 common for the different variants of type A virus of the Hong Kong form; this was used to examine 1968-1976 isolates for presence of H3 antigen and to achieve neutralization of infectivity of viruses by antibodies to one antigenic determinant of H3. In the period 1968-1972 the H3 antigen predominated in the viruses isolated, but its activity lessened in the A/Port Chalmers/1/73 and in some viruses isolated from 1975-1976. Correlation was shown between the content of H3 antigen and the capacity of anti-H3 antiserum to inhibit the infectious activity of the viruses. The prepared serum is appropriate for analysis of antigenic composition of newly isolated influenza viruses. Figure 1; references 12: 9 Russian, 3 Western.

USSR

UDC 616.9-036.22-07(049.3)

METHODOLOGY FOR ASSESSMENT OF INTENSITY OF THE EPIDEMIC PROCESS

Moscow ZHURNAL MIKROBIOLOGI III EPIDEMIOLOGII I IMMUNOLOGII in Russian No 3, 1978 pp 133-134 manuscript received 4 Aug 77

BELYAYEV, N. P., Vinnitsa

[Abstract] The present article constitutes a critique of the article "The Procedure of Epidemic-Process Intensity Assessment," by K. A. Denisov, which had appeared in No 7, 1976 of this journal. The criticized article was "an attempt, by means of a mathematical method, to objectivize the analysis of an epidemic process." Denisov's article is criticized on the grounds that while the infectious condition of the population is entirely justly divided into manifest and nonapparent states, the procedure for calculating the average daily morbidity of the nonapparent form of infection is held to be inadmissible from the logical and mathematical point of view. The critic proposes that calculations for the nonapparent forms should be conducted by the

same formula as for the manifest forms, but with somewhat different premises as the point of departure. References 11 (Russian).

USSR

UDC 616.988-036.25

#### LASSA FEVER AND MARBURG DISEASE

Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 3, 1978 pp 42-46

MYASNENKO, A. M., honored doctor of the RSFSR, doctor of medical sciences, Lieutenant Colonel, medical service reserve

[Abstract] A survey of the origins and epidemiology of the two diseases, based primarily on World Health Organization studies (WHO Bulletin, 1976, Vol 52n Nos 4, 5, 6, parts 1 and 2). The findings of Leifer (1970), Carey (1972), Fraser (1974), Monath (1977), Buckley and Casals (1970) and other Western specialists are surveyed. For Marburg disease the works of Monath (1974), Zuckerman (1976), Kalter (1968), Kissling and others (1970, Kurstak (1976) and Martini and others (1968) are outlined. Treatment is basically symptomatic. In Monath and Casals (1976) successful results with plasma and interferons are mentioned. No specific treatment or immunization have been found. Individuals suspected of having the disease should be isolated and strict anti-epidemic measures should be carried out. Patients should not be removed beyond the endemic regions. Individuals returning from African nations in which the diseases are endemic, and who have fevers of unknown origin, should be isolated at special hospitals. No mention is made of any Soviet or other specific cases. References 8: 2 Russian, 6 Western.

USSR

UDC 574.64:577.1

SOME BIOCHEMICAL MECHANISMS OF RESISTANCE OF AQUATIC INVERTEBRATES TO TOXICANTS

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian No 6, Nov/Dec 77 pp 69-73 manuscript received 9 Feb 77

BIRGER, T. I., and MALYAREVSKAYA, A. YA., Institute of Hydrobiology, Academy of Sciences UkrSSR, Kiev

[Abstract] The examination of aerobic and anaerobic metabolism in *Rivulogammarus lacustris* L., *Dreissena polymorpha* Pallas and *Chironomus plumosus* L., showed a direct relationship between ability to synthesize nicotinamide enzymes and their resistance to the toxic effects of green algae and pesticides (DDT). In *Rivulogammarus* coenzymes were reduced by 10.9% while in *Dreissena* they doubled, and in *Chironomus* they increased almost 9n fold. Coenzyme content decreased by 35% in *Dreissena* poisoned by DDT while it increased almost 3 fold in *Chironomus*. The quantity of reduced coenzymes increased in all species. Tables present data on changes in content of nicotinamide coenzymes and changes in vitamin B<sub>1</sub> content. The latter almost triples in *Dreissena* and *Chironomus* living in low oxygen conditions, while in *Rivulogammarus* it is reduced by 93-95%. Invertebrates which had increased B<sub>1</sub> also exhibited decreased thiaminase activity (11-43%), while for oxyphilic animals thiaminase activity increased 12-163% depending upon toxin concentration. This increased thiaminase activity can lead to B<sub>1</sub> avitaminosis in fish. The ability of some invertebrates to shift from aerobic to anaerobic metabolism enables them to withstand higher concentrations of toxins. Reductions in thiaminase prevents avitaminosis. References 7 (Russian).

USSR

UDC 639.3.043.2:639.371.7

EFFECTIVE GRANULAR FEED FOR INDUSTRIAL FATTENING OF THE AMERICAN CHANNEL CAT

Moscow RYBNOYE KHOZYAYSTVO in Russian No 4, Apr 78 pp 23-25

SKLYAROV, V. YA. and STUDENTSOVA, N. A., Krasnodar Branch, All-Union Scientific Research Institute of Commercial Fisheries

[Abstract] Feed formulas were investigated for their effectiveness in fattening the American channel cat both in terms of weight gain and cost-effectiveness. The optimum feed formula, OR-1, consisted of the following composition: 10.1% fish meal, 7.9% meat-bone marrow, 19.6% corn meal, 14.0% wheat flour, 5.0% grass meal, 10.0% soya meal, 8.4% sunflower meal, 10.0% 'hydrolytic' yeasts, 10.0% 'hydrocarbon' yeasts, 4.0% sunflower phosphatides, 1.0% premix P-2-1, and 0.25% methionine.

## GRANULATED FEED FOR TROUT DERIVED FROM PLANT AND MICROBIAL COMPONENTS

Moscow RYBNOYE KHOZYAYSTVO in Russian No 3, Mar 78 pp 28-31

KANID'YEV, A. N. and SKLYAROV, V. YA.

[Abstract] Several varieties of granulated feed designed for 1 and 2 year old rainbow trout were tested for cost-effectiveness vis-a-vis Formula-1 feed containing 45% fish flour. The results showed that in terms of physiologic parameters and cost-effectiveness Formula-2 feed was most suitable for commercial operations, in which the decrease in fish meal from 45% to 15% was made possible by increasing sunflower cake component from 8.0% to 54.0% and hydrolytic yeasts from 5.0% to 10.0%. The complete composition of Formula-2 feed is: 15.0% fish meal, 2.0% meat-bone marrow meal, 3.0% blood, 7.0% wheat flour, 1.0% grass flour, 1.0% algal meal, 54.0% sunflower meal, 10.0% hydrolytic yeasts, 6.0% phosphatides, 1.0% premix PF-1-V, 1.40% lysine, 0.30% methionine, and 11145 kJ/kg energy yield; the overall composition consists of 41.1% protein, 8.8% lipids, and 30.4% carbohydrates.

USSR

UDC 576.858.75.097.2.095.14:535-31

ANTIGENIC PROPERTIES OF A INFLUENZA VIRUS INACTIVATED BY ULTRAVIOLET IRRADIATION

Moscow VOPROSY VIRUSOLOGII in Russian No 1, Jan/Feb 78 pp 74-79 manuscript received 4 Jul 77

BOKHNEVICH, G. M., FRIDMAN, E. A. and PERADZE, T. V., Leningrad Scientific Research Institute of Epidemiology and Microbiology imeni Pasteur

[Abstract] Allantois cultures of virus A/Victoria/72 (H3N2), A/Scotland/74 (H3N2), reproductive recombinants A/MRC-1 (H3N2), Scotland/74--impure and purified by adsorption chromatography on porous glass--were studied in this work. Ultraviolet irradiation of the purified virus leads to irreversible inactivation of the virus. The rate of inactivation is directly proportional to degree of purification. Neuraminidase, hemagglutinating and antigenic activity of the virus are lowered after 7-10 min UV irradiation, a period greater than required for inactivation of the purified virus (viz., 1-2 min). Two experimental series of vaccines were prepared by the cited method; one was inactivated by UV irradiation, the other with formalin. The immunogenic properties of these vaccines were tested on human volunteers, and were apparently the same. Figures 2; references 16: 11 Russian, 5 Western.

USSR

UDC 576.858.75.097.34.097.2.007

INVESTIGATION OF THE ANTIGENIC SPECIFICITY OF HEMAGGLUTININ OF TYPE A INFLUENZA VIRUSES BY QUANTITATIVE RADIOIMMUNOLOGICAL ANALYSIS. COMPARATIVE STUDY OF DIFFERENCES IN SPECIFICITY OF HEMAGGLUTININ H3 IN EPIDEMICALLY ACTIVE STRAINS

Moscow VOPROSY VIRUSOLOGII in Russian No 1, Jan/Feb 78 pp 15-19 manuscript received 4 Jul 77

YAMNIKOVA, S. S., YAKHNO, M. A., BEREZINA, O. N., BLOKHA, V. V. and ZAKSTEL'-SKAYA, L. YA., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

[Abstract] Virus strains examined included human influenza viruses belonging to group A (H3N2) on the basis of antigenic structure: A/Hong Kong/1/68; A/Port Chalmers /1/73; A/Scotland /840/74; A/Victoria /3/75; A/Tokyo /1/75; A/Victoria /112/76; also used were strain A/PR8/34 with antigenic formula HON1 and two strains of type B influenza isolated in 1976-1977 epidemics. Comparative radioimmunological analysis (CRIA) revealed distinct type differences in the hemagglutinin of the types A and B viruses and in

the subtypes H0 and H3. Use was made, for the first time, of a system from a purified hemagglutinin, labelled with I-125, and an antiserum to it. This system proved sufficiently specific and highly sensitive and successfully exposed the differences in hemagglutinin cited as well as strain variations within one (H3) subtype. The CRIA helps to define qualitative and quantitative characteristics of determinant renewal within antigenic drift. A/Victoria /3/75 had more quantitatively renewed determinants than strain A/Scotland /870/74 and less than A/Victoria /112/76 which can be viewed as the following drift variant. The epidemic strains circulating after 1972 had no more than 10% of the antigenic determinants of the original strain of A/Hong Kong /1/68. Figure 1; references 12: 2 Russian, 10 Western.

USSR

UDC 612.6.02.017.1.014.46:615.339:576.858.095.383

#### INFLUENCE OF EXOGENOUS INTERFERON UPON TRANSPLANTATION REACTIONS IN MICE

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1978 pp 45-50 manuscript received 31 Dec 75

OGURTSOV, R. P. and ZHELEZNIKOVA, G. F., Institute of Experimental Medicine, Academy of Medical Sciences USSR; Central Scientific Roentgenoradiological Research Institute, Leningrad

[Abstract] A study is conducted of the influence of the serum obtained at various periods after the administration of interferon inducers (Newcastle disease virus, amino ethylisothiuronium, E. coli endotoxin) upon the rejection rate of a skin or cell transplant of male C3H, CBA, and CC57Br mice weighing 16-18 grams. The allogeneous skin transplant perished more rapidly, the elimination of allogeneous lymphoid cells was accelerated, colony formation by allogeneous bone-marrow cells in the spleen of an irradiated recipient was suppressed with the administration of serum obtained within the period of the maximum content of the interferon induced by the Newcastle-disease virus and by amino ethylisothiuronium. The cyclotoxic activity of the lymphocytes of mice CC57Br in relation to the allogeneous target cells rose in the presence of these sera. A serum containing interferon induced by the E. coli endotoxin did not affect the allotransplant rejection rate and did not increase the cyclotoxic activity of the lymphocytes. References 6: 3 Russian, 3 Western.

USSR

UDC 615.241.3:547.757].012.6+576.851.513.083.3

NUTRIENT MEDIUM FOR DIRECT SYNTHESIS OF L-TRYPTOPHAN BY *B. SUBTILIS*

Moscow *KHIMIKO-FARMATSEVTICHESKIY ZHURNAL* in Russian No 4, 1978 pp 94-98  
manuscript received 17 Jul 77

SEMEANOVA, L. E., MINEYEVA, L. A., ZHDANOVA, N. I. and VELIKZHANINA, G. A.,  
All-Union Scientific Research Institute on Genetics and Selection in Industrial Microbiology, Moscow

[Abstract] The following medium was shown to support maximum synthesis of L-tryptophan by *B. subtilis* gen-37 (72 hr at 28-30°C, 220-240 rpm shaker): 10.0% glucose, 0.5% urea, 2.0% corn extract, 0.06%  $\text{KH}_2\text{PO}_4$ , 0.14%  $\text{K}_2\text{HPO}_4$ , 0.1%  $\text{MgSO}_4$ , 0.05%  $\text{NaCl}$ , tap water, pH 7.0. The yield of L-tryptophan from 5 ml of medium in 50 ml tubes was 2.4-3.4 g/L, 3.8-4.6 g/L from 2 changes of 20 ml medium in Erlenmeyer flasks (250 ml), and 4.1-4.5 g/L from 10 L of medium in 20 L fermenters. Figure 1; references 13: 4 Russian, 9 Western.

USSR

UDC 576.852.1

ISOLATION OF RESIN DEGRADING ACTINOMYCETES

Tashkent *UZBEKSKIY BIOLOGICHESKIY ZHURNAL* in Russian No 2, 1978 pp 9-11  
manuscript received 22 Sep 77

ASKAROVA, S. A., and ISMAILOVA, T. KH., Tashkent Oblast State Pedagogical Institute

[Abstract] Several methods were tested for their effectiveness in uncovering strains of actinomycetes capable of degrading various resins. The method most effective consisted of applying a solution of rubber dissolved in benzene (10 mg/ml) to a Petri dish containing solid No 2 Hause medium, permitting the benzene to evaporate with the formation of a rubber film, and then placing agar blocks of a 7 day culture on the film for incubation for 5-7 days at 28°C. Clear zones around individual agar blocks served to identify active strains. Natural rubbers that were tested were found to be susceptible to degradation by actinomycetes, while synthetic rubbers were in general resistant to biodegradation. References 16: 2 Russian, 14 Western.



USSR

UDC 576.8.095

UTILIZATION OF THE GAS CONDENSATE PRODUCED AT THE FERGANA PETROLEUM REFINERY PLANT BY CANDIDA AND TORULOPSIS YEASTS

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 2, 1978 pp 3-5 manuscript received 17 Oct 77

BIL'MES, B. I., BORODINA, R. A., GALKINA, N. N., KASYMOVA, G. A., and RUNOV, V. I., Institute of Microbiology, Academy of Sciences Uzbek SSR

[Abstract] Dearomatized gas condensate from the Fergana Refinery Plant was employed as sole carbon source for *Candida lipolytica*, *C. curvata*, and *Torulopsis candida* cultured in 10 L and 100 L fermenters on a mineral medium at 28-30°C with aeration. Under these conditions the mean biomass yield was 6.1 g/L, consisting of 52-60% crude protein (Nx6.25), 37.8-40.6% protein (Lowry), 5.1-21.5% lipids, and 4.1-12.1% residual hydrocarbons. Hot extraction of the biomass with 1:1 alcohol:ether reduced the lipid content to 1.01-5.5%, and cold extraction with hexane reduced residual hydrocarbons to 0.2%. References 9 (Russian).

USSR

UDC 576.809.53

EFFECT OF CULTIVATION CONDITIONS ON THE SYNTHESIS OF EXTRACELLULAR ACID PROTEINASE FROM ASPERGILLUS AWAMORI 78-2

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 14 No 2, Mar/Apr 78 pp 165-171 manuscript received 13 Apr 77

SHAKHOVA, T. V. and KONOVALOV, C. A., All-Union Scientific Research Biotechnical Institute, Moscow

[Abstract] Conditions of cultivation of Aspergillus awamori 78-2 to allow active synthesis of extracellular acid proteinase were examined. The mold was grown in a modified Capek medium (starch, 2%;  $\text{KH}_2\text{PO}_4$ -0.1%;  $\text{MgSO}_4$ -0.05%;  $\text{FeSO}_4$ -0.001%;  $\text{NaNO}_3$ -0.91%). Ammonium salts of mineral and organic acids, as well as amino acids, were added and were the only source of nitrogen. Salts of mineral and organic acids promoted growth of Aspergillus awamori 78-2 but varied in affecting biosynthesis of acid proteinase; ammonium chloride (0.4%) accelerated synthesis most effectively. Of the amino acids, only cysteine (16 mg by nitrogen) and aspartic acid (30 mg by nitrogen) brought about the formation of more active acid proteinase. In tests of salts containing phosphorus and sulfur, high yields of acid proteinase were obtained from  $\text{KH}_2\text{PO}_4$  (0.5%) or  $\text{NaH}_2\text{PO}_4$  (0.4%), (0.67 units/ml and 0.60-0.63

units/ml, respectively) and salts of sulfuric acid (excepting  $\text{KHSO}_4$ ) were conducive to synthesis of acid proteinase. In factory production conditions on a medium of rye flour (2%),  $\text{KH}_2\text{PO}_4$  (0.5%), and  $\text{MgSO}_4$  (0.02%), procedures used in aeration and stirring were important; best results were received in a medium aerated with one volume air per one volume medium per min. with simultaneous stirring at a rate of 180 rev/min. Under those conditions the activity of the enzyme after 36 hrs was 2.55 units/ml and time of fermentation was reduced two fold. References 10: 4 Russian, 6 Western.

USSR

UDC 577.150.6+576.809.53

EFFECT OF NUTRIENT MEDIUM COMPOSITION ON THE BIOSYNTHESIS OF CELLULOYTIC ENZYMES WITH SUBMERGED CULTIVATION OF FUNGUS TRICHODERMA LONGIBRACHIATUM 7-26

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 14 No 2, Mar/Apr 78 pp 172-176 manuscript received 31 May 77

SALOVAROVA, V. P., GRACHEV, YU. P. and VAGANOVA, M. S., Moscow Technological Institute of Food Industry

[Abstract] An optimal medium for biosynthesis of cellulolytic enzymes using submerged cultivation of Trichoderma longibrachiatum 7-26 was sought. The culture was in a rocker (200 rot/min) in 750 ml flasks at 28-30°. Components of the medium to promote biosynthesis of cellulolytic enzymes were examined. Among carbon sources, sugarbeet pulp (2%) was associated with the greatest amount of cellulolytic enzyme production. Maximum results with sources of mineral nitrogen were seen with addition of nitric acid ammonia ( $\text{C}_1$  enzyme activity, based on paper disintegration, was 5.44 units/ml). Further addition of  $\text{KH}_2\text{PO}_4$  raised enzyme activity. Examination of some organic substances indicated that malt sprouts and corn extract improved the medium. Optimization of the program was calculated based on the Box-Williams method. An ideal medium was proposed: sugarbeet pulp--4.60%, ammonium nitrate--0.70%,  $\text{KH}_2\text{PO}_4$ --0.30%, and malt sprouts and wheat clippings in a ratio 1:0.750. This medium produced an activity of 16.3 units/ml for  $\text{C}_1$  enzyme and 193.8 units/ml for  $\text{C}_x$  enzyme activity (based on amount of sugars formed under action of the enzyme in 1% solution of sodium carboxymethyl-cellulose. References 11: 10 Russian, 1 Western.

USSR

UDC 577.156

# PREPARATION AND PROPERTIES OF SEVERAL MICROBIAL PROTEINASES, IMMOBILIZED ON SILOCHROME

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 14 No 2, Mar/Apr 78 pp 228-31 manuscript received 5 Jul 77

ZAYTSEVA, L. A., IVANOVA, G. P., MIRGORODSKAYA, O. A. and MOSKVICHEV, B. V., All-Union Scientific Research Technological Institute of Antibiotics and Enzymes for Medical Application, Leningrad

[Abstract] The process of immobilization of bacterial proteolytic enzymes terrilytine and hygrolytine on the mineral matrix silochrome was investigated. The basic procedure for enzyme immobilization on silochrome is illustrated. Different types of silochrome were utilized. Terrilytine; a proteolytic enzyme from *Aspergillus terricola*, was purified initially by dialysis. Activation of the aminosilochrome was done with 12.5% solution glutaric aldehyde (GA) with constant mixing for 24 hr. and repeated washing. Immobilization on activated silochrome was done by mixing 100 mg enzyme preparation in 0.1 phosphate buffer pH 6.0-10.0 with 0.5 g activated silochrome at 20°. Enzyme activity was measured by a modified method of Kunitz. Maximal catalytic activity of terrilytine was found when the silochrome: enzyme weight ratio was 5:1 in solution pH 8.0; the ratio for hygrolytine was 1:1. Optimum temperature for immobilized terrilytine activity was 100 higher than that of the native enzyme. The pH optimum for immobilized terrilytine on casein had an extreme in the alkali range. Stability was tested by repeated use of the enzyme for casein hydrolysis. Overall, the immobilization process resulted in high enzymatic activity and stability. Figures 4; references 14: 7 Russian, 7 Western.

USSR

UDC 576.809.6

# INDUCED RESISTANCE IN POTATOES TO PARASITIC FUNGI

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 14, No 2, Mar/Apr 78 pp 262-70 manuscript received 16 Nov 77

METLITSKIY, L. V., OZERETSKOVSKAYA, O. L., DOROZHKIN, N. A., IVANYUK, V. G., CHALOVA, L. I., YURGANOVA, L. A. and BARAMIDZE, V. G., Institute of Biochemistry imeni A. N. Bakh, Academy of Sciences USSR Moscow; Belorussian Scientific Research Institute of Potato, Fruit and Vegetable Growing, Minsk

[Abstract] Possibilities for inducing resistance in potatoes by means of metabolites taken from *Phytophthora infestans* infection are examined. Three fractions from mycelium extract were investigated; one of these possessed a

strong ability to induce necrosis. This fraction contained 58% lipids, 35% carbohydrates, and 6% protein. It was apparent that the basis of the fraction was lipoglycoprotein (LGP). LGP in a 0.0005% concentration increased height of plants and stimulated stem formation. LGP greatly increased resistance to several diseases caused by parasitic fungi in different potato varieties. Defensive action occurred even when concentration was low (0.0001%). Unlike other methods used today where action is designed to inhibit the parasite, the described method induces resistance in the plants. Figures 4; references 17: 9 Russian, 8 Western.

USSR

UDC 577.154+577.150.3

DEPENDENCE OF IMMOBILIZED GLUCOAMYLASE STABILITY ON THE METHOD OF IMMOBILIZATION

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian No 2, 1978 pp 236-42 manuscript received 13 Jun 77

SINITSYN, A. P., KLIBANOV, A. M., KLESOV, A. A. and MARTINEK, K., Moscow State University

[Abstract] The authors tested thermal stability of glucoamylases immobilized on porous glass by 13 different methods. Stability was examined with and without a substrate (30% dextrine, dextrose equivalent 24) at 65° and 75°. With the substrate, a strongly stabilizing effect was evident. The reason for this appeared to be a change of enzyme conformation in interaction with the substrate, the result of which is higher thermal stability. When immobilization of glucoamylase was conducted in the presence of 30% dextrine solution, thermal stability was three times greater than stability of enzyme immobilized in the absence of the substrate. Speed of inactivation of the glucoamylase was found to be independent of the dextrine concentration. This effect is apparently connected with the fact that dextrine possesses a high affinity with the enzyme and a 5% solution is already saturated. References 27: 4 Russian, 23 Western.

USSR

UDC 616.127-002-056.3057:615.33

TOXICO-ALLERGIC MYOCARDITIS ARISING IN OCCUPATIONAL CONTACTS WITH ANTIBIOTICS

Moscow SOVETSKAYA MEDITSINA in Russian No 1, 1978 pp 11-15 manuscript received 14 Apr 76

BOGOSLOVSKAYA, I. A., GERASIMOVA, YE. A., PARFENOVA, YE. A., SOKOLOVA, V. G., FILYUSHINA, Z. G., and KHIL, R. G., Clinical Department, Gor'kiy Scientific Research Institute of Labor Hygiene and Occupational Diseases

[Abstract] Previous research has indicated that prolonged industrial contact with antibiotics can cause damage to bodily organs and systems including the cardiovascular. A group of 40 patients with toxico-allergic myocarditis aged 22-50 years who had been in production contact with antibiotics (penicillin and streptomycin) for 3.5 to 15 years were compared to a second group of 40 who worked under similar conditions but had no symptoms. The control group was 30 healthy individuals. None had suffered from heart disease prior to starting work. The illness was preceded by various allergy symptoms. Cardialgia and in 40% stenocardia characterized the myocarditis. Systolic noise at the apex cordis was noted in 22 individuals in the first group, tachycardia in 24, and a subfebril condition noted in 26. The latter was only half as frequent in the second group. Heart size was normal and hypertension and hypotension were rare. The EKGs of all individuals indicated local and diffuse disturbances in myocardium repolarization, in 13 patients an inverse T wave, and in half the patients, depressions of the RS-T interval. The EKG readings only improved for 13 patients and became normal for only 3 during their stay in the clinic (ranging from 3 weeks to 2 months). EKGs in the second group revealed bradycardia and sinus arrhythmia in 5. Skin tests for sensitivity to penicillin and streptomycin caused increased heart pain in 5 patients, and even though tests were positive for an additional 7 there were no EKG changes. There were changes in heart contraction phase structure in two-thirds of the first group; in only 2 in the second. This was primarily an increased period of isometric contraction. All of the 35 patients observed for 1-3 years after having contact with antibiotics experienced reduced pain, and 7 ceased to complain. Inflammatory changes, the onset of myocarditis after allergic symptoms in individuals with high sensitivity to antibiotics affirm the diagnosis. Their work should avoid contact with antibiotics. References 11: 10 Russian, 1 Western.

USSR

UDC 612.64:[612.014.4:547.233

FEATURES OF THE INFLUENCE OF SOME INHIBITORS OF ATMOSPHERIC METAL CORROSION  
(AMINES OF THE POLYMETHYLENE SERIES) UPON EMBRYOGENESIS

Leningrad ARKHIV ANATOMII GISTOLOGII I EMBRIOLOGII in Russian No 3, 1978  
pp 80-87 manuscript received 18 Jul 77

BARILYAK, I. R., PAUSTOVSKAYA, V. V. and TORBIN, V. F., Industrial Toxicology  
Laboratory (in charge Prof I. M. Trakhtenberg), Kiev Scientific Research In-  
stitute of Labor Hygiene and Occupational Diseases, Kiev

[Abstract] A study of the influence of some amines of the polymethylene  
series (inhibitors MSDA-II, NDA, M-I) upon the generative function in gen-  
eral and upon embryogenesis in particular is conducted on white rats. It is  
found that these inhibitors of atmospheric metal corrosion exert a pronounced  
gonadotoxic and embryotoxic effect, depending upon the dose of the substance  
and the chemical nature of the compound. The least active preparation was  
the M-I inhibitor--an oil-soluble cyclohexyl amine salt. References 16: 11  
Russian, 5 Western.

USSR

UDC 616-006.6-092:54-4]:615.217.22

MODIFICATION OF THE PHYSIOLOGIC EFFECTS OF ADRENOMIMETICS BY CHEMICAL  
CARCINOGENS

Leningrad VOPROSY ONKOLOGII in Russian No 4, 1978 pp 49-52

GURKALO, V. K. and PLISS, G. B., Chemical Carcinogens Laboratory, Order of  
the Red Banner of Labor Scientific Research Institute of Oncology, Ministry  
of Health USSR imeni N. N. Petrov

[Abstract] To determine whether a possible relationship exists between  
blastomogenic transformation and the functional level of the sympathetic  
nervous system, studies were conducted on the effects of 2 carcinogens, 2-  
acetylaminofluorene (AAF) and diethylnitrosoamine (DENA), on in vitro re-  
sponsiveness of rat and guinea pig atria to norepinephrine (NE) and isopropyl-  
arterenol (IPA). While low concentrations of DENA (less than 0.01 ug/ml) or  
of AAF (1 ug/ml) increased the frequency and amplitude of atrial contractions,  
high concentrations (DENA: 1-10 ug/ml; AAF: 10-50 ug/ml) were inhibitory in  
both species. These effects were seen only in animals 6 months old or older  
and were more pronounced in the rat preparation. Evaluation of the effects  
of DENA and AAF on the inotropic effects of NE or IPA on rat and guinea pig  
atria demonstrated that DENA acts as an alpha adrenergic receptor blocker  
for rat and guinea pig atria, while AAF functioned as an alpha blocker in the

guinea pig and as a beta receptor blocker in the rat system. 20-methylcholanthrene, which abolishes the hepatocarcinogenesis of AAF in the rat, also abolished its function as a beta blocker. The data appear to indicate that, at least in the case of AAF and DENA, neoplastic transformation may be due to the effectiveness of these carcinogens in modifying the action of biogenic amines. Figures 3; references 15: 7 Russian, 8 Western.

USSR

UDC 616-006.04-02:616-006-02]-092.9:599.323.4

#### INDUCTION OF MALIGNANCIES IN RATS BY NICKEL-CONTAINING AEROSOLS

Leningrad VOPROSY ONKOLOGII in Russian No 4, 1978 pp 44-48

SAKNYN', A. V., senior scientist, candidate of medical sciences, and BLOKHIN, V. A., senior scientist, candidate of medical sciences, Scientific Research Institute of Labor Hygiene and Occupational Diseases, Sverdlovsk

[Abstract] Studies were conducted on the induction of malignancies in outbred albino rats by nickel-containing aerosols, such as encountered under industrial conditions, e. g., feinstein [sic] dust (metallic nickel, nickel sulfide, nickel monoxide, water-soluble nickel accounting for 36.6-71.5% of dust composition). Exposure via the respiratory route by means of inhalation (1.5 m<sup>3</sup> chamber filled with 70 mg/m<sup>3</sup> dust; 5 h/day exposures 5 days per week for 6 months) resulted in lung cancer in one of the 5 experimental animals 17 months after the last exposure to the dust. A single intratracheal administration of nickel monoxide (40 mg/rat) yielded lung cancer in one of 26 rats after a similar latent period, while intraperitoneal injections of feinstein dust (90-150 mg per rat) resulted in reticular cell sarcoma of peritoneal lymph nodes or fibrosarcoma in 6 out of 39 animals. The findings provide proof for the blastomogenic action of nickel-containing dust and indicate the need for effective dust control at the concerned enterprises. Figures 4; references 12: 5 Russian, 7 Western.

USSR

UDC 616.988.75-092.9

EXPERIMENTAL INFLUENZA DUE TO INCOMPLETE FORM OF INFLUENZA VIRUS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 4, 1978 pp 436-438 manuscript received 24 May 77

FROLOV, A. F., SHCHERBINSKAYA, A. M., MAKSIMOVICH, N. A. and KUZ'MENKOVA, L. V., Infectious Diseases Scientific Research Institute, Ministry of Health Ukrainian SSR, Kiev

[Abstract] C57BL and CBA mice were infected intranasally with incomplete, native, and heat inactivated A/Hong Kong/1/68 virus in equivalent doses in order to study the nature and course of experimental influenza. The virus could not be isolated from any tissue of mice infected with the native virus after 7 days that developed an acute proliferative/desquamating pneumonia, marked hemorrhage, and peri- and panbronchitis. The mortality in this group was 72.1% with recovery after 30 days; some of these animals showed the development of protracted chronic pneumonia without a tendency to resolution. Mice infected with inactivated virus yielded virus from the lungs for 45 days and up to 15 days from other tissues; the mortality in this group was 27.4%. Histologic examination of the lungs showed predominantly a proliferative component combined with marked inflammatory changes and, after 3 months, evidence of lymphoid infiltration consisting of monomorphic cells with deeply staining nuclei. Alveolar and bronchial epithelium showed pronounced proliferation and anaplasia, and mesenteric glomangiomas developed in 18.7% of these mice. Tissues of animals injected with the heat inactivated virus failed to yield virus at any time. References 6: 4 Russian, 2 Western.

USSR

UDC 576.8.097.22:615.33]:576.8.095.5(047)

BIOLOGICAL PROPERTIES AND MECHANISMS OF THE EMERGENCE OF BACTERIA RESISTANT TO FUSIDIN, ERYTHROMYCINE, CHLORAMPHENICOL

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 3, 1978 pp 8-15 manuscript received 5 Mar 77

GAMALEYA, N. B. and LEVASHEV, V. S., Second Moscow Medical Institute imeni Pirogov

[Abstract] A survey of the literature is conducted to ascertain the phenomenon of pleiotropicity among bacteria mutants that are characterized by changes of certain ribosomal proteins. Among such mutants are those resistant to the 50S ribosomal subparticles, such as erythromycin and chloramphenicol, as well as to fusidin, whose action-application locus is not so much the ribosome itself, as the EF-G protein translocation factor. References 66: 19 Russian, 47 Western.



USSR

UDC 615.332:632:931

INFLUENCE OF ANTIBIOTICS ON BAC POPPILIAE CULTURES

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 1, Jan 78 pp 52-53  
manuscript received 4 Jul 77

BAGDASARYAN, S. N., Institute of Microbiology, Academy of Sciences Arm SSR

[Abstract] Bac. Poppiliae has been used in previous studies to find new microbiological agents to attack harmful insects. Cultures from a Peoria, Ill. laboratory and from France were exposed to various antibiotics. A table presents the degree of growth suppression. Most antibiotics had a strong depressing effect. Subtiling has a weak effect, while dextramycietine, amfomycin,) polymixin B, and gramicidin had no growth suppression effect. References 3: 1 Russian, 2 Western.

USSR

UDC 631.466.1

STUDY OF THE PHYTOTOXIC SUBSTANCE PENICILLIUM GRANULATUM

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 14 No 2, Mar/Apr 78 pp 315-319 manuscript received 21 Feb 77

BERESTETSKIY, O. A., PATYKA, V. F. and NADKERNICHNYI, S. P., All-Union Scientific Research Institute of Agricultural Microbiology, Leningrad; Ukrainian Scientific Research Institute of Agricultural Microbiology

[Abstract] The goal of this work was to isolate and study phytotoxic substances in the microscopic fungus Penicillium granulatum strain 4806, and also to research possibilities of forming these substances directly in soil. The fungus was cultivated in a liquid medium and filtered. Phytotoxic substances were extracted by means of organic solvents and sorbtion methods, and isolated by paper chromatography. A filtrate of the fungus completely inhibited a majority of roots and seeds of cultivated plants and weeds, and didn't affect microorganisms. Highest phytotoxic activity occurred on the 10-13th days of fungus growth. A substance was isolated using multiple chloroform extraction and propanol crystallization. Properties of the substance led researchers to classify it with low molecular weight peptides. In a concentration 100-150 ug/ml, the substances completely inhibited cress, radish and cucumber seeds as well as corn root seedlings. Experiments to produce the substance in soil were successful. Figures 4; references 18: 15 Russian, 1 Ukrainian, 2 Western.

USSR/GDR

UDC 547.963.3

STRUCTURE OF NUCLEAR PRE-mRNA. IX. HYBRIDIZATION OF THE DOUBLE STRANDED REGION OF PRE-mRNA WITH EXCESS mRNA

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 2, 1978 pp 334-342 manuscript received 11 Mar 77

RYSKOV, A. P., TOKARSKAYA, O. N., COUTELLE, CH., and HUNGER, H.-D., Institute of Molecular Biology, Academy of Sciences USSR, Moscow, the Central Institute of Molecular Biology, Academy of Sciences GDR, and the Institute of Physiological and Biological Chemistry, Humboldt University, Berlin, GDR

[Abstract] Investigations were undertaken on homologous hybridizations between the double stranded region of pre-mRNA obtained from Ehrlich ascites carcinoma cells, rabbit bone marrow cells, or primary culture of rabbit kidney on the one hand, and excess of polyA<sup>+</sup> mRNA from mouse ascitic carcinoma or rabbit hepatocytes, or with rabbit globulin mRNA, on the other hand. Hybridization was followed from the appearance of RNase-resistant acid insoluble material, as well as from adsorption of the hybrid complexes on polyU-Sepharose. The results indicated formation of relatively stable pre-mRNA/mRNA complexes with a melting temperature of 90-92°C for murine mRNA and ca. 80°C for globulin mRNA complexes. The lengths of the complexes were in the range of 20-60 nucleotides for the complexes involving murine mRNA and 20-40 nucleotides (with a peak at 30) for the globulin mRNA complexes. Figures 5; references 15: 2 Russian, 13 Western.

USSR

UDC 576.858.25.083.35.098.396.332

STUDY OF REPARATIVE SYNTHESIS OF DNA INDUCED BY UV IRRADIATION IN HUMAN CELLS CHRONICALLY INFECTED BY TICK ENCEPHALITIS VIRUS

Moscow BOPROSY VIRUSOLOGII in Russian No 1, Jan/Feb 78 pp 104-107 manuscript received 31 Jan 77

CHEKOVA, V. V., MARININA, V. P. and BOGOMOLOVA, N. N., Institute of General Genetics, Academy of Sciences, Moscow

[Abstract] Bogomolova, et al, had earlier demonstrated that Hep-2 cells, non-infected or primarily-infected with tick encephalitis virus (TE) are capable of excision reparation. These cells have been employed to emulate their capacity for reparative replication by DNA synthesis induced by UV irradiation in primary and chronic TE. The DNA synthesis--measured autoradiographically with respect to inclusion of H3-thymidine label in the cell nucleus--induced by UV is unappreciable in non-UV-irradiated cells.

TE inhibits DNA repair; the chronic TE decreases DNA synthesis to a greater extent than the primary TE infection. In an experiment with caffeine, the latter was found to have essentially no effect on DNA synthesis after UV irradiation of the cells. Cadmium, a common environmental contaminant, also did not affect the level of DNA repair after UV irradiation of TE-infected cells. TE substantially affects reparative mechanisms of cell repair. Figures 3; references 8: 5 Russian, 3 Western.

USSR

UDC 576.851.48.097.22:615.33

#### CERTAIN BIOLOGICAL PROPERTIES OF E. COLI SK CELLS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 4, 1978 pp 441-443 manuscript received 3 Jun 77

ANIKEYCHEVA, N. V., NIKOL'SKAYA, I. I. and DEBOV, S. S., academician of the Academy of Medical Sciences USSR, Laboratory of Enzymology, AMS USSR

[Abstract] Studies were conducted on E. coli SK, which is noncolicinogenic but shows multiple antibiotic resistance (tetracycline, kanamycin, penicillin, polymyxin, ampicillin), to determine whether host specificity for the DNA viruses PBV-1 and PBV-3 is plasmid related. Subculturing of the starting strain yielded a whole series of variant cultures showing variable susceptibilities to the antibiotics of interest which were unrelated to PBV-1 or PBV-3 specificities. The activities of restricting and methylating enzymes (viral DNA substrate) were identical for the various subcultures. References 10: 5 Russian, 5 Western.

USSR

UDC 547.963.32.02

#### NUCLEOTIDE SEQUENCE OF A FRAGMENT OF BACTERIOPHAGE f-1 GENE IV

Moscow BIOORGANICHESKAYA KHIMIYA in Russian No 4, 1978 pp 569-570 manuscript received 28 Nov 77

GRACHEV, S. A., KOLOSOV, M. N., KOROBKO, V. G. and PETROV, N. A., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, Academy of Sciences USSR, Moscow

[Abstract] Nucleotide sequence map is presented for 2 tandem fragments, HaeIII-H and HaeIII-I, obtained from bacteriophage f-1 DNA following cleavage with endonuclease HaeIII. The sequence of 180 nucleotides (106 for HaeIII-H, 70 for HaeIII-I, and 4 representing GG and CC cleavage sites) contained 10 termination codons so distributed that only one frame remains

free for reading. On the basis of the nucleotide map the C-terminal amino acid sequence of proteins coded for by this portion of gene IV can be deduced. References 8: 2 Russian, 6 Western.

USSR

UDC 547.96

PRIMARY STRUCTURE OF THE ALPHA-SUBUNIT OF E. COLI DNA-DEPENDENT RNA POLYMERASE. V. CYANOGEN BROMIDE PEPTIDES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian No 4, 1978 pp 437-449 manuscript received 11 Jul 77 and 23 Aug 77, after revision

MODYANOV, N. N., LIPKIN, V. M., SMIRNOV, YU. V., SHUVAYEVA, T. M. and KOCHERGINSKAYA, S. A., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, Academy of Sciences USSR, Moscow

[Abstract] The primary structure of the alpha-subunit of E. coli DNA-dependent RNA polymerase was determined through cyanogen bromide cleavage (500-fold reagent excess per mole of methionine; at room temperature in 70% formic acid for 20 h), followed by analysis of the hydrolysate by means of Sephadex G-75 gel chromatography (pH 8.0: 6 M guanidine HCl + 0.1% 2-mercaptoethanol) and determination of N-terminal amino acid residues. The 6 resultant peptides were subjected to amino acid analysis and the completed amino acid sequence data are presented. Figures 4; references 17: 8 Russian, 9 Western.

USSR

UDC 576.809.5:632.937.15

SPECIFIC ENDONUCLEASE FROM BAC. THURINGIENSIS

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian No 1, Jan 78 pp 3-7 manuscript received 13 May 77

ZAKHARYAN, E. G., ZAKHARYAN, R. A., CHARCHOGLYAN, A. A., KARAGEZYAN, K. A., and AFRIKYAN, E. K., Institute of Experimental Biology, Academy of Sciences ArmSSr; Institute of Microbiology, Academy of Sciences ArmSSR

[Abstract] A specific endonuclease from strain 837 of Bac. thuringiensis var caucasicus, a producer of an entomocide toxin is isolated and described. The MacChetie (1967) method is used to obtain the DNA. The endonuclease acts on the phage DNA of phage lambda b<sub>2</sub> SV 40 and the mitochondria of rat and rabbit liver. A diagram shows fractional distribution. It primarily

attacks superspiral forms of DNA, and optimal effects require the presence of Mg ions. The enzyme changes ring DNA into linear. There are two antiparallel GC sequences at the restriction site. Figures 2; references 11: 2 Russian, 9 Western.

USSR

UDC 547.963.3

PHYSICOCHEMICAL STUDIES ON THE NUCLEIC ACID OF BACTERIOPHAGE  $\phi$ B

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 2, 1978 pp 377-384 manuscript received 30 Mar 77

KARATAYEV, G. I., BOGUSH, V. G., REBENTISH, B. A., PLOTNIKOVA, T. G., NARODITSKAYA, V. A., and PERMOGOROV, V. I., All-Union Scientific Research Institute for the Genetics and Selection of Industrial Microorganisms, Moscow

[Abstract] The nucleic acid of a newly isolated bacteriophage, designated as  $\phi$ B, capable of lysing *Brevibacterium flavum* was subjected to physicochemical analysis which identified it as a double stranded DNA molecule. Further studies on the elucidation of its nature revealed a 52 $\pm$ 1% G+C content and the formation of 12 fragments following hydrolysis by *Eco*R1 endonuclease. The molecular weight of the DNA molecule is 30 ( $\pm$ 1)  $\times 10^6$  daltons. Electron microscopy revealed linear and ring forms and the fact that the left end of the  $\phi$ B DNA represents the free end, in analogy to the findings for bacteriophages P2, 186, P4, and  $\lambda$ . Figures 5; references 20: 3 Russian, 17 Western.

USSR

UDC 547.963.3

STRUCTURE OF NUCLEAR PRE-mRNA. X. NEW TYPE OF DOUBLE STRANDED STRUCTURE IN PRE-mRNA

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 2, 1978 pp 343-355 manuscript received 17 May 77

KRAMEROV, D. A. and RYSKOV, A. P., Institute of Molecular Biology, Academy of Sciences USSR, Moscow

[Abstract] Further studies were conducted on phenol-extracted heavy nuclear mRNA precursor (pre-mRNA) from Ehrlich ascites carcinoma cells, which includes both a moderately long (80-200 base pairs) double stranded segment and a 300-800 base pair double stranded region; the latter does not recover

its double stranded structural characteristics after thermal melting of pre-mRNA. The  $C_{ot1/2}$  values for renaturation of the moderately long and the lengthy mRNA are  $5 \times 10^{-4}$  and  $2 \times 10^{-2}$ , respectively, pointing to the greater complexity of the latter. Additional studies with cross-renaturation, hybridization with repetitive DNA, hybridization with mRNA (including cytoplasmic and polysomal polyA mRNA in the case of the length fragment) indicated that not more than ca. 3% of the nucleotide sequence of moderately lengthy pre-mRNA is included in the lengthy pre-mRNA, and that the latter represents either symmetric transcription of structural genes or of DNA sequences complementary to each other located on different portions of the genome. Figures 9; references 29: 2 Russian, 27 Western.

USSR

UDC 577.150.2

TEMPLATE PROPERTIES OF DECADEOXYNUCLEOTIDE d(pCCACGAAACC) in ESCHERICHIA COLI RNA POLYMERASE SYSTEM

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 2, 1978 pp 327-333 manuscript received 10 Mar 77

BADASHKEYEVA, A. G., DENISOVA, L. YA., ZAGREBEL'NYY, S. N., KNORRE, D. G., PUSTOSHILOVA, N. M. and SHUBINA, T. N., Special Technological Construction Bureau of Biologically Active Substances, Main Industrial Microbiology Administration, Council of Ministers USSR, and the Institute of Organic Chemistry, Siberian Branch, Academy of Sciences USSR, Novosibirsk

[Abstract] E. coli RNA polymerase (EC 2.7.7.6) was employed in the transcription of the decadeoxyribonucleotide pCpCpApCpGpApApApCpC, resulting in products that exceeded the length of the template 2-3 fold. Subsequent hydrolysis of the product by pancreatic RNase resulted in the isolation of a pentanucleotide, GpGpGpGpUp, which represented transcription of a "pseudo-continuous" region of 2 adjacent templates on the enzyme molecule. In addition, the pentadeoxynucleotide d(pGGTTT), which is complementary to the 3' end of the template, served as an effective primer in the system at a primer: template monomer ratio of 1:1. Figures 3; references 12: 4 Russian, 8 Western.

USSR

UDC 547.963.3

PHYSICOCHEMICAL PROPERTIES OF SENDAI VIRUS RNA. III. INTERACTION WITH PROFLAVINE

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 2, 1978 pp 316-326 manuscript received 10 Mar 77

YAROSLAVTSEVA, N. G., KHRISTOVA, M. L., BUSSE, T. L. and KHARITONENKOV, I. G., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

[Abstract] Scatchard plots were constructed for the binding of proflavine to single (I) and double (II) stranded RNA isolated from Sendai virus strain 960. The binding isotherms revealed 2 high affinity binding constants corresponding to two different populations of binding sites (A and B) in the case of both I and II. In both cases binding constants for A were greater than for B at all ionic strengths tested. Decreasing the ionic strength markedly increased A binding constant while not affecting the number of A sites in the case of II; however, in the case of both I and II lowering of the ionic strength results in an increase of the total number of binding sites (A+B). At low ionic strength ( $10^{-4}$  M NaCl) the number of binding sites for both types of RNA is essentially equivalent to that exhibited by DNA at high ionic strength (1 proflavine molecule per 3 nucleotide pairs). Studies on thermal denaturation of the proflavine-RNA complexes in relation to ionic strength revealed 2 melting temperatures ( $T_m$ ) for II, while the high  $T_m$  was evident only at high ionic strength for I. Apparently helical regions in I are responsible for increased proflavine binding at low ionic strength as well as the appearance of high  $T_m$  at high ionic strength. Figures 7; references 18: 6 Russian, 12 Western.

USSR

UDC 576.858.75

INTRACELLULAR STRUCTURE OF INFLUENZA VIRUS

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian No 2, 1978 pp 308-315 manuscript received 10 Feb 77

TENTSOV, YU. YU., GITEL'MAN, A. K. and BUKRINSKAYA, A. G., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

[Abstract] Investigations were conducted on influenza-infected chick fibroblasts in order to effect a comparison between the nuclear virus-specific structures and those of the cytoplasm. After 1 h of incubation in the presence of tritiated uridine and actinomycin D identical viral ribonucleoproteins

appeared in the cytoplasm and the nucleoplasm (25-60S in sucrose density gradients and 1.34-1.35 g/cm<sup>3</sup> in CsCl density gradients). Comparison of data obtained with short term tritiated uridine labeling and determinations of in vitro polymerase activities of various cellular fractions revealed the presence of virus-specific structures in the nucleoplasm which participated in the synthesis of viral RNA and contained viral ribonucleoproteins. However, these proteins differed from the ribonucleoproteins in terms of sedimentation constants in sucrose and glycerol density gradients (60-90S) and by higher buoyant densities. Polymerase activity in the cytoplasm was limited to the sedimentation zone of the viral nucleoproteins. Figures 4; references 15 (Western).



USSR

UDC 616.36-004-092.9-085.272.6:547:963.32

EFFECTS OF EXOGENOUS ORGAN-SPECIFIC RNA ON REVERSIBLE ULTRASTRUCTURAL AND FUNCTIONAL CHANGES IN LIVER CIRRHOSIS IN THE RAT

Moscow BYULLLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian No 4, 1978 pp 495-501 manuscript received 29 Jun 77

VAKULIN, G. M., MARCHENKO, V. T., PRUTOVYKH, N. N. and YAKOBSON, G. S., Central Scientific Research Laboratory, and the Department of Pediatric Surgery, Pediatric Faculty, Novosibirsk Medical Institute

[Abstract] Histochemical, electron microscopic, and biochemical studies were conducted on morphological and function changes occurring in the livers of 180-230 g Wistar rats (males) with cirrhosis subsequent to  $\text{CCl}_4$  exposure (4 h periods of inhalation, twice per week for 6 weeks). Examinations of the hepatic specimens over a 60 day period indicated progressive normalization of hepatocyte structure without, however, complete recovery. Other changes affected the endoplasmic reticulum and were reflected in dysproteinemia (elevated globulins, depressed albumin). Intraperitoneal administration of high MW RNA from bovine livers (5 mg/100 g) every other day for 20 days, beginning with the 8th day after last exposure to  $\text{CCl}_4$ , markedly enhanced morphologic and functional recovery of the liver and resolution of collagen fibers, promoted elevation of serum albumin and led to depression of elevated globulin levels. Intramuscular RNA was less effective (same dose and schedule). However, prolonged intraperitoneal or intramuscular RNA administration (40 or 60 days) led to toxic manifestations: increased lipid infiltration, marked reduction in glycogen and ribosomes, and increased fragmentation and vacuolization of the endoplasmic reticulum. Figures 3; references 14: 11 Russian, 3 Western.

USSR

UDC 615.277.3.011.4:615.277.3.099

CORRELATION BETWEEN THE PHYSICOCHEMICAL PROPERTIES AND ANTITUMOR ACTIVITY AND TOXICITY OF 6-SUBSTITUTED AMINO-2,4-DIETHYLENIMINO-1,3,5-TRIAZINES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian No 4, 1978 pp 67-73  
manuscript received 7 Jun 77

IVIN, B. A., FILOV, V. A., KRAYZ, B. O., BELOGORODSKIY, V. V., MALYUGINA, L. L., POL'KINA, R. I. and KOZLOVSKIY, YU. N., Oncology Scientific Research Institute imeni N. N. Petrov, Ministry of Health USSR, Leningrad

[Abstract] Structure-activity studies were conducted with 6-substituted amino-2,4-diethylenimino-1,3,5-triazines in efforts to correlate their physicochemical properties with toxicity ( $LD_{100}$  and  $LD_{50}$  in moles/kg) and hematotoxicity for intact mice and antineoplastic activity in sarcoma-37 bearing mice. Evaluation of the biological effects vis-a-vis chemical reactivity (Taft's  $\sigma^*$  constant) and hydrophilic nature (distribution coefficient (P) in water-octanol system) demonstrated that maximum effectiveness was demonstrated by highly hydrophilic 6-hydroxyalkylamino-2,4-diethylenimino-1,3,5-triazines. In addition to the observation that the top of the parabolic curve  $\lg 1/c = f(\lg P)$  corresponds to maximum biological effect, according to the Hansch equation, a reverse relationship was also noted in that, in some cases, the top corresponded to minimum effectiveness. Figures 3; references 16: 8 Russian, 8 Western.

USSR

UDC 615.355:577.152.311.042.2

SYNTHESIS AND STUDIES ON REVERSIBLE ACETYL CHOLINESTERASE INHIBITORS. DI-(AMINOALKYLAMIDES) OF TEREPHTHALIC ACID

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian No 4, 1978 pp 63-66  
manuscript received 9 Nov 77

ALEKSANDROVA, M. L., ANDROSOV, N. S., IOFFE, D. V. and PANYUKOV, A. N., Institute of Toxicology, Ministry of Health USSR, Leningrad

[Abstract] Description is provided of the synthesis of 10 di-(aminoalkylamide) derivatives of terephthalic acid  $[X(CH_2)_nNHCO\text{-benzene ring-CONH}(CH_2)_nX]$  and their evaluation as inhibitors of human erythrocyte acetylcholinesterase (AChE). In 0.01 M KCl, pH 7.8, these inhibitors acted on par with galanthamine and showed a mixed type of competitive/noncompetitive inhibition. Structure-activity studies demonstrated the absolute need for 2 amino groups for high anti-AChE activity; however, there were no significant differences between tertiary and quaternary compounds. Elevation of the ionic strength

to 0.175, pH 7.0, increases the inhibitory activity of galanthamine while depressing that of the amides. The marked effects of ionic strength on the inhibitory activity of the amides, as well as the fact that the distance between the basic groups is virtually without effect, indicates a poor fit between the amides and the site of adsorption on the enzyme. Figure 1; references 6: 4 Russian, 2 Western.

USSR

UDC 616.281:547.551.525.211.1

SYNTHESIS, TOXICITY, AND SPASMOLYTIC ACTIVITY OF SOME AMINOETHYLSULFONES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian No 4, 1978 pp 55-58

APON, I. F., STOLYARCHUK, A. A., IL'YUCHENOK, T. YU., TSYSHKOVA, N. G. and TROFIMOV, F. A., Vinnitsa Medical Institute imeni N. I. Pirogov, and the Medical Radiology Scientific Research Institute, Academy of Medical Sciences USSR, Obninsk

[Abstract] Data are provided on the synthesis of 20 aryl-2-aminoethylsulfones (R-benzene ring-SO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>X·HCl), including 4-CH<sub>3</sub>OC<sub>6</sub>H<sub>4</sub>SO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NNCH<sub>2</sub>-CH<sub>2</sub>SO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>OCH<sub>3</sub>-4 (I) with a view toward obtaining novel spasmolytic agents. Determinations of toxicity on male and female mice demonstrated that the LD<sub>50</sub> decreased from 130.6 mg/kg to 8.9 mg/kg with the following succession of R substituents: H, 3-NO<sub>2</sub>, CH<sub>2</sub>CONH, Br, Cl, 4-CH<sub>3</sub>, 3-NO<sub>2</sub>, C<sub>2</sub>H<sub>5</sub>, and C<sub>2</sub>H<sub>5</sub>O. Compounds with a secondary amino group increased sharply in toxicity when X = NHCH<sub>3</sub> was replaced by X = NHC<sub>4</sub>H<sub>9</sub>. In vitro studies with sections of rabbit small intestine and in vivo experiments established that 2 compounds with X = pyridyl-4 and R = 4-C<sub>2</sub>H<sub>5</sub> or R = 4-C<sub>2</sub>H<sub>5</sub>O were somewhat less effective as spasmolytic agents than papaverine, while I showed greater activity than papaverine. The other compounds in this series were ineffective in this respect. References 10: 1 Polish, 6 Russian, 3 Western.

USSR

UDC 615.277.3:547.673.6

IMMUNOSTIMULANTS. I. SYNTHESIS AND PHARMACOLOGIC ACTIVITY OF 1,2-BIS-[2-(DIETHYLAMINO)ETHOXY]ANTHRAQUINONE DIHYDROCHLORIDE

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian No 4, 1978 pp 46-50  
manuscript received 10 Nov 77

BOGATSKIY, A. V., KOVETSKIY, R. YE., LITVINOVA, L. A., LEMPART, G. V.,  
ANDRONATI, S. A., BALITSKIY, K. P., UMANSKIY, YU. A., VEKSLER, I. G.,  
YAKIMENKO, L. V. and FILIPPOVA, T. O., Physicochemical Institute, Academy  
of Sciences Ukrainian SSR, Odessa, and the Institute of Oncologic Problems,  
Academy of Sciences Ukrainian SSR, Kiev

[Abstract] Conditions are described for the synthesis of 1,2-bis-[2-(diethylamino)ethoxy]anthraquinone dihydrochloride (I), an analogue of tilorone, by the treatment of alizarin with beta-diethylaminoethylchloride·2HCl. Testing of I for antineoplastic properties on outbred albino rats and mice yielded growth inhibitions of experimental tumor in the range of 22.3% to 50.1% in most cases (0% for a lymphosarcoma), and combined use with thiophosphamide markedly limited metastatic spread. Further studies showed that I increased the number of splenic antibody forming cells, elevated complement levels, and increased the thymic index. In addition, I failed to give any evidence of toxicity and did not depress leukocyte formation or erythropoiesis. References 20: 2 Ukrainian, 11 Russian, 7 Western.

USSR

UDC 632.4:576.8.097.29

ISOLATION AND IDENTIFICATION OF MYCOTOXIN T-2 PRODUCED BY FUSARIUM SPOROTRICHIELLA

Moscow DOKLADY VASKhNIL in Russian No 3, Mar 78 pp 36-38 manuscript received  
14 Feb 77

YERMAKOV, V. V., candidate of biological sciences, KOSTYUNINA, N. A. and  
KURMANOV, I. A., doctor of veterinary sciences, All-Union Scientific Research  
Institute of Veterinary Sanitation

[Abstract] Chemical steps are described which resulted in the isolation and identification of Fusarium sporotrichiella mycotoxin T-2: trichotecene 8-alpha-(3-methylbutyryloxy)-4-beta, 15-diacetoxycirp-9-ene-3-alpha-ol, for which the structural formula is given. Figures 2.

ISOLATION, PROPERTIES, AND AMINO ACID COMPOSITION OF THE TOXINS IN THE VENOM OF THE CENTRAL ASIAN SCORPION BUTHUS EUPEUS

Moscow BIOORGANICHESKAYA KHIMIYA in Russian No 4, 1978 pp 450-461 manuscript received 6 Sep 77

GRISHIN, YE. V. and SOLDATOV, N. M., Institute of Biorganic Chemistry imeni M. M. Shemyakin, Academy of Sciences USSR, Moscow and TASHMUKHAMEDOV, B. A. and ATAKUZIYEV, B. U., Institute of Biochemistry, Academy of Sciences Uzbek SSR, Tashkent

[Abstract] Physical chemical studies, conducted on the venom of the Central Asian scorpion *Buthus eupeus*, resulted in the isolation of 12 toxic peptides, 8 of which were toxic for mice and 4 for cockroaches (*Nauphoeta cinerea*). Each of the toxic components was established to be homogenous on the basis of several criteria; further, each of the 8 peptides toxic for mice and one of the peptides toxic for cockroaches contained 60-75 amino acids and a MW of ca. 7000-8000, and was characterized by the presence of 9-13 aspartyl residues and the absence of methionine. The 3 remaining peptides toxic for cockroaches contained 35-36 amino acid residues, including methionine, and an equivalent MW of ca. 4000. In addition, all 12 polypeptides contained 4 intramolecular disulfide bonds. Figures 14; references 20: 4 Russian, 16 Western.

USSR

UDC 611.818.2-018.83-086:612.273.2

MICROSTRUCTURE OF RETICULAR-FORMATION NEURON DENDRITES OF THE BRAIN STEM  
DURING ACUTE HYPOXIC HYPOXIA

Leningrad ARKHIV ANATOMII GISTOLOGII EMBRIOLOGII in Russian No 3, 1978 pp  
67-72 manuscript received 2 Dec 77

TUMANSKAYA, L. M., Brain Ultrastructure Laboratory (in charge Prof N. N. Bogolepov), Brain Institute, Academy of Medical Sciences USSR, and Department of Pathological Anatomy (in charge docent N. F. Polyakov), Zaporozh'ye Medical Institute

[Text] [Russian abstract provided by the source] An electron-microscope investigation of reticular-formation neuron dendrites during acute hypoxic hypoxia was conducted in 45 adult rats of the Wistar strain. Structural changes begin at the terminal portions of the dendrites, and are more strongly expressed than in the pericaryon. Dystrophic and destructive changes are classified in accordance with the dynamics of their development: a) generalized focal or total swelling of the dendrite mitochondrias; b) swelling of the dendrite terminals and reduction of the microtubules; c) destructive changes of dendroplasma organoids; d) appearance of glycogen granules; e) the accumulation of secondary lysosomes; f) swelling and devastation of the dendrite stems; g) the formation of large cavities and dendrite destruction. Figures 5; references 11: 9 Russian, 2 Western.

USSR

UDC 634.13:575.12

INITIAL MATERIAL FOR CREATION OF GENETICALLY-DETERMINED LATE PEAR CULTIVARS

Moscow GENETIKA in Russian Vol 14 No 4, Apr 78 pp 594-598 manuscript received 21 Mar 77

TUZ, A. S., Maykop Experimental Station of the All-Union Scientific Research Institute of Plant Growing imeni N. N. Vavilov

[Abstract] The limited number of late-ripening pear sorts in the USSR demands priority selection efforts on introduction of late pears adapted to local conditions. The present article describes work on this subject underway since 1963. The Maykop station has, in its collection, 32 species of pears and 345 West European and Central American sorts, 127 Caucasus and Crimean sorts, 54 East European and 56 eastern and central Asian sorts. These are tabulated according to term of ripening. Crossing parents (late sorts with slow-growing sorts) used in this work are also tabulated. Five new late sorts and five promising cultivars with various ripening terms were obtained. The proven successes were elite No 6-79, Obilnaya (Barile Desham x Bergamot Esperena); Vesnyanka 6-53 (Triumph of Vienna x Dekanka); Iskra 37-33 (Gervais x Notarius Lepen); Orbita 37-8 (Marguerita Marilla x Parizhskaya); and Pozdnyaya MOS VIR (Barile Desham x Angelica Paduanskaya). The promising types have not yet been thoroughly tested. References 16: 13 Russian, 3 Western.

USSR

UDC 581.143.6

REPRODUCTION OF VIRUS-FREE POTATO PLANTS BY TUBERS PRODUCED IN VITRO

Moscow FIZIOLOGIYA RASTENIY in Russian Vol 25 No 2, Mar/Apr 78 pp 373-378 manuscript received 11 Feb 77

MOROZOVA, S. YE. and MELIK-SARKISOV, O. S., All-Union Scientific Research Institute of Applied Molecular Biology and Genetics, Moscow

[Abstract] Sterile potato tubers for convenient year-round storage were obtained by optimizing mericlone reproduction and tuber formation. Tubers were produced by transplanting grafts into nutrient medium containing macro and trace elements, FeEDTA, thiamine, pyridoxine, nicotinic acid, ascorbic acid, sucrose, agar and beta-indolylbutyric acid. A glucose concentration of 2 and 3% for the Izobiliye sort and of 3% for the Istrinskiy sort facilitated tuber formation in the lower parts of the plants. Prolonged dark periods and lowered temperature increased tuber formation, as did higher levels of beta-indolylbutyric acid, alpha-naphthylacetic acid or beta-indolylbutyric

acid. The data indicate that, in order to obtain tubers, cuttings from the base of the shoot should be cultivated in a medium with 3% glucose using an eight hour photoperiod and at 10°C for at least twelve days. Plant regeneration should be conducted on the apical section of the shoot, cultivated in 2% sucrose with 0.05 mg/l beta-indolylbutyric acid, with a temperature of 26°C and a 16 hour photoperiod. Figures 2; references 10: 4 Russian, 6 Western.

USSR

UDC 633.16:632.4

#### BARLEY RESISTANCE TO RHYNCHOSPORIOSIS

Moscow DOKLADY VASKhNIL in Russian No 3, Mar 78 pp 7-9 manuscript received 25 May 77

PERESYPKIN, V. F., corresponding member, All-Union Academy of Agricultural Sciences imeni V. I. Lenin and DRAPATYY, N. A., Ukrainian Scientific Research Institute of Plant Protection

[Abstract] Recent investigations conducted in connection with the spread of rhynchosporiosis in Western Ukraine have demonstrated that while there are no varieties of barley entirely resistant to this disease, certain varieties show greater resistance than others. Factors responsible for, or contributing to, resistance have been identified as: thickness of leaf cuticle, high peroxidase and polyphenolperoxidase activities, high ratio (1.08) of protein to nonprotein nitrogen in the plant, and fungicidal properties of the plant sap. References 5 (Russian).



USSR

UDC 547.466:543.544:633.16

COMPARISON OF AMINO ACID COMPOSITION OF PROTEINS IN HIGH LYSINE CONTENT  
AND COMMON BARLEYS

Kiev FIZIOLOGIYA I BIOKHIMIYA KUL'TURNYKH RASTENIY in Russian No 2, 1978  
pp 138-45 manuscript received 24 Jun 77

SOZINOV, A. A., GARKAVYY, P. F., PROPERELYA, F. A., IGNATOVA, S. A., NETS-  
VETAEV, V. P. and NAVOLOTSKIY, V. D., All-Union Selection-Genetic Institute,  
Odessa

[Abstract] Amino acid composition of protein in Khiproli and Rizo 1508, high lysine mutants of barleys, as compared to common barleys was investigated. Compared to common barleys, groats of Khiproli exhibited a high content of essential amino acids--lysine, methionine, tryptophan. Rizo 1508 had even greater amounts of lysine, methionine and threonine. Both Khiproli and Rizo 1508 exhibited differences in protein content, including essential and nonessential amino acids, when compared to each other and to common barleys. Each had quantities of lysine and other amino acids distributed differently in various fractions. Khiproli exhibited high lysine content in water-salt and alkaline fractions; Rizo 1508 showed greater lysine content in alcohol and alkaline fractions. Overall Rizo 1508 fractions showed higher levels of essential and nonessential amino acids, except for the salt fraction. The amino acid content of the alcohol fraction of Rizo 1508 indicates that it is not typical, and it is not a "classical" gordein. References 14: 5 Russian, 9 Western.

USSR

UDC 632.938.1

RESISTANCE OF SPRING WHEAT TO WHEAT SMUT

Moscow ZASHCHITA RASTENIY in Russian No 4, 1978 pp 34-35

PEN'CHUKOVA, V. S. and LITVINOVA, A. G., Kazakh Institute of Plant Protec-  
tion

[Abstract] Studies conducted with several varieties of spring wheat demonstrated that varieties with genetically determined resistance against wheat smut remain resistant for relatively long periods of time under adverse conditions. Eventual increase in the incidence of wheat smut is due to accumulation of the infective agent and diseased plants from year to year. The following varieties of spring wheat possess high levels of genetic resistance: Bezenchukskaya-98, Primorskaya-990, and Ural'skaya-52.

## HYGIENIC EVALUATION OF RESIDUAL QUANTITIES OF THE FUNGICIDE EUPARENE IN FOOD PRODUCTS

Moscow VOPROSY PITANIYA in Russian No 2, Mar/Apr 78 pp 72-75 manuscript received 29 Mar 77

BELONozhko, G. A., TOVSTENKO, A. I. and BEZKROVNAYA, YE. V., Laboratory of Hygiene and Toxicology, Nematocides and Zoonides, All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers, and Plastics, Kiev

[Abstract] Under natural conditions Euparene (N', N'-dimethyl-N-phenyl-fluorodichloromethylthiosulfamide (I) was established to be converted into N', N'-dimethyl-N-phenyldiamide sulfide (II) under the influence of precipitation and solar radiation. Following spraying of strawberry patches, I and II persist on the plants for up to 18 days and more at levels of 0.02-0.4 and 0.008-0.15 mg/kg, respectively; corresponding findings on sprayed grapes were ca. 0.26-1.30 and 0.16-0.50 mg/kg. Toxicity studies revealed the following LD<sub>50</sub> values: 4630 mg/kg for rats, 1905 mg/kg for mice, and 805 mg/kg for guinea pigs. The coefficient of cumulation on administration of 1/20 LD<sub>50</sub> of I was 3.7 for mice and 3.3 for guinea pigs, while the threshold dose during chronic administration was 5.4 mg/kg for guinea pigs and 1.6 mg/kg represented the subthreshold dose. II was determined to be twice as toxic as I for mice (LD<sub>50</sub> = 820 mg/kg); however, II showed lesser propensity for tissue accumulation with a cumulative coefficient greater than 5. Final conclusion was that trace levels of I on grapes cannot exceed 1.3 mg/kg for human consumption, while strawberries must be completely free of I. Further recommendations were that the waiting time for spraying vineyards be 30 days for 3 kg/hectare of I, and 15 days for strawberries with 1.2 kg/hectare. References 3: 2 Russian, 1 Western.

USSR

UDC 633.88:631.53.027.2

USE OF SEED DISINFECTANTS IN GROWING OF MEDICINAL PLANTS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian No 4, 1978 pp 87-91  
manuscript received 10 Oct 77

DROSDOVSKAYA, L. S. and nosyrev, v. i., All-Union Scientific Research Institute of Medicinal Plants, Moscow Oblast

[Abstract] A review is presented of the current Soviet practice with respect to the use of seed disinfectants and antibiotics on medicinal plants in order to increase germination and prevent seed-transmitted diseases. The most extensively and effectively used seed disinfectants in the USSR are tetramethylthiuram disulfide and thiuram, although, recently, excellent results have been obtained with the use of the fungicide benomyl (Benlate) and its use is on the increase.

USSR

UDC 613.281-074:615.277.4.07

DETERMINATION OF N-NITROSAMINES IN MEAT AND MEAT PRODUCTS

Moscow VOPROSY PITANIYA in Russian No 2, Mar/Apr 78 pp 65-72 manuscript received 8 Jun 77

POKROVSKIY, A. A. (Deceased), KOSTYUKOVSKIY, YA. L., MELAMED, D. B., and MEDVEDEV, F. A., Institute of Nutrition, Academy of Medical Sciences USSR, Moscow

[Abstract] A description is provided of fluorometric, chromato-mass spectrometric, and mass-spectrometric techniques used to analyze Soviet and non-Soviet meat and meat products for the presence and levels of N-nitrosamines (NA). The analytic results showed that NA were not detected in fresh or stored meat or meat stuffing (-10 to -12°C for 3 months). However, in 25.0-54.5% of the samples of cooked sausage dimethylnitrosamine (I) was present (1.9-3.3 ug/kg), as well as diethylnitrosamine (II) (1.5-4.2 ug/kg) and nitrosopiperidine (III) (0.9-1.8 ug/kg). In smoked and semi-cured sausages the levels of I, II, and III were somewhat higher (2.9-5.4, 3.8-6.1, and 1.6-23.4 ug/kg, respectively). In addition, in certain samples of sausage and ham dipropylnitrosamine and nitrosopyrrolidine were identified. In general, the spectrum of NA seen in Soviet and non-Soviet meat products was identical, although the levels were slightly higher in the foreign meat products. Figure 1; references 17: 3 Russian, 14 Western.

USSR

UDC 615.361.018.46+615.385.3] 014.413.002.5

UTILIZATION OF THE UKKM-1M SET-UP FOR CRYOPRESERVATION OF THE BONE MARROW AND LEUCOCYTES

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 1, Jan/Feb 78 pp 48-50 manuscript received 29 Mar 76

IOFFE, A. L., OGANOV, S. I., BADALOV, P. M., LESNYAK, A. I., and GASPARYAN, E. L., Scientific Research Institute of Hematology and Blood Transfusion, Ministry of Health Uzbek SSR

[Abstract] Although the BF-4 "Linde" (USA) is probably the best system it has shortcomings. The most modern such device in the USSR, the UKKM-1M, was built by Institute of Cybernetics of the Academy of Sciences Georgian SSR and the Physical-Technical Institute of Low Temperatures, Academy of Sciences Uzbek SSR. It is intended for freezing of bone marrow and nuclei-containing blood cells, and for research work in cryobiology. Liquid nitrogen is the refrigerant. A table shows the general layout. There are 4 freezing chambers

which can freeze up to 1,200 ml per cycle, with a cooling rate of 0.5-30 degrees per minute. This requires up to 15 liters of liquid N per cycle. Service life is 6 years. The basic parameters are presented. Three years of operational use indicates that a voltage stabilizer should be used to maintain operational parameters. When smaller volumes (2-30 ml) of biological products are cooled the cooling rate is much higher (40-85 degrees per min). Since, according to studies cited, some cells can survive freezing at this rate, the device can be used for other purposes. The possibility of registering temperatures directly on the cells or tissue is a unique feature for Soviet devices. Series production was begun in 1975. Figure 1; references 5: 4 Russian, 1 Western.

USSR

UDC 615.47.012:669.14.018.8

#### POSSIBLE USE OF NEW CORROSION RESISTANT STEEL IN THE MANUFACTURE OF MEDICAL INSTRUMENTS

Moscow MEDITSINSKAYA TEKHNIKA in Russian No 1, Jan/Feb 78 pp 35-38 manuscript received 12 Dec 76

BIRMAN, S. R., STAROZHITSKIY, M. I. and KUZNETSOV, A. M., Moscow Evening Metallurgy Institute

[Abstract] Instruments made from carbon steels with high chrome content are not sufficiently corrosion resistant and are not easily worked. There are now new types of corrosion resistant steels with good mechanical properties. These include: 04KH11N9M2D2TYU, OKH14N5MD2YU, 03KH13G3MD2, 10KH13G3, 20KH13G3. Of these, the first three, martensitic aged steels with high carbon content are comparatively soft (HRC 40-52). After treatment they can be worked more easily. Manganese alloying of 10KH13 and 20KH13 reduces delta ferrite and increases strength. All the steels were subjected to corrosion tests (immersion in a 26% solution of  $MgSO_4$  and a 3% NaCl solution, and all proved to be very resistant. The optimum combination of hardness and plasticity is obtained when the degree of deformation during cold rolling is  $\epsilon = 50-70\%$ . Hardening is achieved by subjecting steels to 500 degrees C for 1 hour after all machining operations. The first three steels have good potential for making needle and rod type instruments. References 4 (Russian).

USSR

UDC 574.64+595.324.2

DAPHNIA MAGNA STR., A TEST OBJECT FOR ESTABLISHING TENTATIVE MAXIMUM PERMISSIBLE CONCENTRATIONS OF TOXICANTS IN SEWAGE

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian No 6, Nov/Dec 77 pp 74-76

POBEGAYLO, P. I. and NOVOSADOVA, T. G.

[Abstract] Only chemical indicators such as nitrogen and phosphorus content are used in monitoring waste water purification operations. Bioindicator organisms, which are much more sensitive than analytic methods, can give better answers about water pollution levels. N. S. Stroganov suggested the use of *Daphnia Magna* Straus as a rapid test organism. Its use resulted in scientific proof of the necessity of constructing purification ponds at oil refineries. Hydrocarbons undergo rapid changes during the biochemical oxidation process. Consequently, maximum limiting doses for organic compounds should be determined after such treatment. The use of *D. Magna* as a bioindicator is very promising as it is quite sensitive to many organic and inorganic toxins. In a 30 day experiment, it was 90-95% successful in determining harmful concentration levels. The results obtained could be used as a preliminary norm for fisheries reservoirs. References none.

USSR

UDC 575.24:582.263:633.353:639.21

STUDY OF GENETIC EFFECTS INDUCED IN POPULATIONS BY RADIOACTIVE PRODUCTS OF U235 NUCLEAR DIVISION. REPORT II. PREDICTION OF GENETIC EFFECTIVENESS OF IRRADIATION AT LOW DOSE RATES

Moscow GENETIKA in Russian Vol 14 No 4, Apr 78 pp 622-631 manuscript received 18 Feb 77

SHEVCHENKO, V. A., PECHKURENKOV, V. L., ABRAMOV, V. I., ZUYEV, N. D. and SUVOROVA, L. I., Institute of General Genetics, Academy of Sciences USSR, Moscow

[Abstract] The study employed radiation sources Sr90-Y90 ( $\bar{E} = 0.55$  Meq) and Pm147 ( $\bar{E} = 0.06$  Meq). Experimental objects were chlorella (*C. vulgaris* Beijer, strain LARG-1), beans (*Vicia faba* L., Russian Black sort), wheat (*Triticum aestivum*, Scala sort) and developing roe (*Misquarnus fossilus* L.). Synchronized chlorella cells were irradiated with Pm 147 nitrate, 3.1-310 rad/day for 24 hr; visual study for mutations was made; the roe was incubated with Sr 90-Y90, number of anaphases with chromosomal aberrations was recorded, 10 and 80 rad/hr; beans and wheat with soil Sr90-Y90, anaphases with chromosomal aberrations and meioses were recorded. The yield of point mutations in chlorella and of chromosomal aberrations in beans and wheat is experimentally dependent on dose when the power index is less than unity; when the dose is doubled the number of induced mutations is not constant but is a function of the dose applied. There is a reciprocal relationship between intensity of irradiation and genetic effect per unit dose. It is assumed that decrease in yield of genetic injury at the doses studied is attributable to reparative action induced by ionizing radiation. Increase in the level of natural mutations will increase the size of samplings from the populations required for analysis for disclosure of a statistically-reliable difference between the observed radiation effect and the level of natural mutations. Applicability of findings to prediction of sequelae of ionizing radiation on natural populations of plants and animals is discussed. Figures 5; references 18: 7 Russian, 11 Western.

USSR

UDC 577.391:591.477

BIOCHEMICAL CHANGES IN THE SKIN OF RATS IRRADIATED AFTER A THERMAL STRESS

Moscow RADIOBIOLOGIYA in Russian Vol 18 No 2, Mar/Apr 78 pp 275-277 manuscript received 19 Nov 76

MATYUSHICHEV, V. B., TATARUKHIN, V. R., SHAMRATOVA, V. G., YUZHAKOVA, G. A. and PETROVA, T. A., Leningrad States University imeni A. A. Zhdanov

[Abstract] Determinations were made of skin levels of creatine kinase (CK) and ATPase of outbred male rats (160-180 g) exposed to various doses of X-rays (25, 50, 100, 250 or 400R) with or without a previous thermal stress (4 h at 36°C air temperature with relative humidity of 80-90%). Evaluations of the results demonstrated highly variable changes in enzyme activities which were completely unpredictable and either indicated a cumulative thermal +irradiation effect, mutual attenuation, or no seeming interaction. The most pronounced changes in CK and ATPase activities were noted with the 36°C+25R and 36°C+25R and 36°C+400R combinations. References 7: 2 Russian, 5 Western.

USSR

UDC 577.391:663.12/14

ROLE OF ENDOGENOUS FACTORS IN ENHANCED RADIORESISTANCE. X. PLOIDY-RELATED RADIORESISTANCE OF THE YEAST *PICHIA GUILLIERMONDII*

Moscow RADIOBIOLOGIYA in Russian Vol 18 No 2, Mar/Apr 78 pp 268-271 manuscript received 1 Aug 77

GONCHARENKO, YE. N., GORSKAYA, T. G., GUDZ', T. I., GUROVICH, A. V., ZOLOTAREVA, L. T., KAPLYA, S. A. and PESHKOVA, YE. I., Faculty of Biology, Moscow State University imeni M. V. Lomonosov

[Abstract] In order to determine the relationship between certain endogenous factors and radioresistance in the case of the yeast *Pichia guilliermondii*, haploid and diploid strains of the latter were evaluated for levels of histamine, serotonin, hydroperoxide, and superperoxide dismutase activity in relation to cellular resistance against X-rays and UV light (254 nm). The results showed that greater resistance to the effects of X-rays on the part of the haploid cells was correlated with higher concentrations of histamine, serotonin, and superperoxide dismutase activity at a statistically significant level vis-a-vis the more radiosensitive diploid cells. On the other hand, fatty acid hydroperoxide concentration was greater in the diploid than in the haploid cells. Further, the diploid cells showed



greater resistance to the lethal effects of UV irradiation than did the haploid cells, presumably due to the higher concentration of cellular DNA. The present findings confirm previous observations on the radioprotective role of biogenic amines and the radiosensitizing implications of high levels of hydrogenperoxide. References 15: 10 Russian, 5 Western.

USSR

UDC 577.391

AGE FACTORS IN THE RADIOSENSITIVITY OF DROSOPHILA PROGENY DERIVED FROM IRRADIATED AND UNIRRADIATED MALES

Moscow RADIOBIOLOGIYA in Russian Vol 18 No 2, Mar/Apr 78 pp 214-217 manuscript received 3 Jan 77

GOL'ZBERG, L. K., and VOROBTSOVA, I. YE., Central Roentgeno-Radiologic Scientific Research Institute, Ministry of Health USSR, Leningrad

[Abstract] Survival studies were conducted on  $F_1$  *Drosophila melanogaster* strain P-68, derived from matings of irradiated ( $F_1I$ ) or unirradiated ( $F_1U$ ) males with unirradiated females, exposed to a single (60 kR) or fractionated (2 x 30 kR at 24 h interval) dose of gamma rays on the 5th, 15th or 30th day of life. The results showed that irradiation on the 5th and 15th day shortened the life span of  $F_1U$  progeny to a greater extent than that of the  $F_1I$  progeny, whereas such differences were not apparent with the 30 day old flies. The data were interpreted to indicate that the progeny carrying a given mutant load ( $F_1I$ ) inherited from one of the parents aged more rapidly and that this accounted for their greater radioresistance, which was comparable to that of normal 30 day old flies. Figures 2; references 5: 2 Russian, 3 Western.

USSR

UDC 577.391:547.963.3

INVESTIGATIONS ON THE MECHANISM OF THERAPEUTIC EFFECTIVENESS OF DNA IN  
EXPERIMENTAL RADIATION SICKNESS

Moscow RADIOBIOLOGIYA in Russian Vol 18 No 2, Mar/Apr 78 pp 192-197 manu-  
script received 5 Nov 76

YEVSEYEVA, N. K., IL'IN, V. V. and KLEMPARSKAYA, N. N.

[Abstract] Investigations with outbred male and female mice (20-23 g) demonstrated that intraperitoneal administration of 0.1 mg/mouse of various DNA preparations ( $14-42 \times 10^6$  daltons) from sturgeon roe 1 or 24 hr after Co-60 irradiation (750 R; 350 R/min) did not lead to any significant changes in the survival of the experimental mice vs. DNA treated unirradiated controls. However, both experimental and control animals responded with an increase in autoantibody levels following DNA treatment. Other changes included alterations in splenic weight, number of splenic endocolonies, alterations in nucleated bone marrow cells, elevation of myelokaryocytes, etc. The changes were variable depending on the molecular weight of the DNA preparation; however, the most pronounced and 'positive' changes were noted with a  $14.3 \times 10^6$  dalton DNA fraction. References 17: 13 Russian, 2 Yugoslav, 2 Western.

USSR

UDC 577.391:547.963.3

CYCLIC NUCLEOTIDES AND RADIORESISTANCE. II. EFFECTS OF CYCLIC NUCLEOTIDES  
ON MAMMALIAN RADIORESISTANCE AND TISSUE OXYGEN LEVELS

Moscow RADIOBIOLOGIYA in Russian Vol 18 No 2, Mar/Apr 78 pp 178-182 manu-  
script received 8 Sep 76

KULINSKIY, V. I., Krasnoyarsk State Medical Institute

[Abstract] Investigations on male CBA mice (3-5 months) subjected to gamma irradiation with 600 or 800 rads ( $LD_{50/30} = 650 \pm 36$  rads) demonstrated that subcutaneous injections of 3',5'-AMP,  $N^6, O^2'$ -dibutyryl-3',5'-AMP (DB), 2',3'-AMP, theophylline, papaverine, imidazole or nicotinate exhibited neither radioprotective nor radiosensitizing effects with respect to 30 day survival figures. However, blockage of the beta-1 and beta-2 adrenergic receptors with N-isopropyl-p-nitrophenylethanolamine, of beta-1 receptors with practolol, or of beta-2 receptors with isopropylmethoxamine resulted in a moderate but statistically significant radioprotective effect following DB administration, although the decrease in tissue  $pO_2$  was less than that seen

without the sympatholytic agents. The data indicated that depression of tissue  $pO_2$  does not per se favor radioresistance. A positive correlation between radioresistance and depression of tissue  $pO_2$  prevails when the latter reflects hypoxia (i.e., circulatory) rather than stimulation of tissue respiration. Figures 2; references 20: 13 Russian, 7 Western.

USSR

UDC 577.391:547.963.3

#### CYCLIC NUCLEOTIDES AND RADIORESISTANCE. I. STATEMENT OF THE PROBLEM

Moscow RADIOBIOLOGIYA in Russian Vol 18 No 2, Mar/Apr 78 pp 175-177 manuscript received 8 Sep 76

KULINSKIY, V. I., Krasnoyarsk State Institute

[Abstract] A brief survey is presented of information available on the potential involvement of cAMP in radioresistance, with the conclusions that cAMP may play a dual role, i.e., may either potentiate or diminish radioresistance. Whether the net effect is protection or increased susceptibility to the action of radiation would appear to be dependent on the species under consideration as well as the physiologic state of the cells or tissues in question involving, in the case of eukaryotic organisms, cyclic nucleotide-dependent protein kinases. In addition, other cyclic nucleotides may also be involved in the phenomena of radioresistance/radiosusceptibility. It appears that a high cGMP:cAMP ratio favors a high degree of radiosusceptibility, and the significance of redox processes has not been definitively settled. References 26: 11 Russian, 15 Western.

USSR

UDC 615.277.3

## EFFECTIVENESS OF CIS-DICHLORODIAMINEPLATINUM (II) AS AN ANTINEOPLASTIC AGENT ALONE AND IN COMBINATION WITH SARCOLYSIN

Leningrad VOPROSY ONKOLOGII in Russian No 4, 1978 pp 53-60

PRESNOV, M. A., doctor of medical sciences, senior scientist, KONOVALOVA, A. L., candidate of biological sciences (CBS), Junior Scientist, ROMANOVA, L. F., candidate of medical sciences, junior scientist, SOF'INA, Z. P., CBS, senior scientist and STETSENKO, A. I., doctor of chemical sciences, professor Cancer Research Center, Academy of Medical Sciences USSR, Moscow; Pharmaceutical Chemistry Institute, Leningrad

[Abstract] The antineoplastic effectiveness of cis-dichlorodiamine-platinum (II) (CDDP) was tested on a variety of intraperitoneally (leukemia and hepatoma-22) or subcutaneously (solid tumors) transplanted malignancies to several strains of mice, using different dosages and routes of administration. Evaluation of the physiologic effects revealed CDDP to be highly toxic (LD<sub>50</sub> for SHY/Kv mice was 12 mg/kg); however, it inhibited solid tumor growth by 34% (proventricular cancer OG-5) to 85% (colonic adenocarcinoma AKATOL), and prolonged the survival times of mice with plasmacytoma MOPC-406 by 11% and of those with leukemia La by 270%. Depending on the dosage employed, inhibition of tumor growth persisted for up to 14 days following cessation of treatment. In the case of colonic adenocarcinoma AKATOL, mammary gland adenocarcinoma Ca-775, and sarcoma-37 combination of CDDP with sarcolysin (merphalan) inhibited tumor growth by ca. 90%, whereas inhibition with either agent alone did not exceed 46-60%. The mechanism of action of CDDP seemed to rest on immunostimulation based on the findings of others and histologic evidence of marked lymphohistiocytic infiltration of the tumors obtained in this study. Figures 4; references 10: 4 Russian, 6 Western.

USSR

UDC 616.33+616.342]-005.1-036.88

MORTALITY IN ULCEROUS GASTRODUODENAL HEMMORHAGES AND WAYS OF DECREASING IT

Leningrad VESTNIK KHIRURGII in Russian No 3, 1978 pp 26-29

TARANENKO, L. D., professor, and Candidates of Medical Sciences PAPAZOV, F. K., ANISHIN, N. S., GNENNYI, N. A., VERKHULETSKIY, I. YE. and MURAV'YEV, A. D., Surgical Clinic (in charge Prof L. D. Taranenko), Faculty for the Advanced of Physicians Training Donets Medical Institute imeni A. M. Gor'kiy)

[Abstract] In an analysis of the treatment results of 9688 patients with ulcerous gastroduodenal hemorrhages, it has been found that 8014 of them (83.4%) received conservative treatment with succeeding death of 366 (4.4%), while 1674 of the patients (17.6%) were operated upon: 299 (17.8%) of the latter died. Out of a total of 451 fatalities from gastroduodenal hemorrhage of ulcerous etiology, 183 (40.6%) were over 60 years of age. In most of the cases the cause of death, regardless of the method of treatment, were irreversible changes in the organs and tissues as a result of prolonged blood loss and hemorrhagic anemia. The opinion is expressed that mortality may be decreased in repeated or primary profuse hemorrhage through surgical intervention at the height of hemorrhage. References 7 (Russian).

USSR

UDC 616.2-001.17

BURNS OF THE RESPIRATORY TRACT

Leningrad VESTNIK KHIRURGII in Russian No 3, 1971 pp 76-80

MURAZYAN, R. I., and SMIRNOV, S. V., candidate of medical sciences, Second Surgical Clinic (in charge Prof R. I. Murazyan), Central Scientific Research Institute of Hematology and Blood Transfusion, Moscow

[Abstract] From a survey of 167 cases with thermal injuries to the respiratory tract and the body integument, it is reported that 121 of the patients (72.4%) died, the immediate cause of death being pneumonia and pulmonary-cardiac insufficiency as a complication of upper respiratory-tract burns in 31.7% of the mortalities. Transfusion therapy is recommended, with account taken of the ascertained hemostasis and hemodynamic damage. Microtracheostomy is held to be a highly valuable procedure for injuries of this kind. References 8: 6 Russian, 2 Western.

USSR

UDC 616-001.17-089:615.381

BLOOD AUTOTRANSFUSION IN THE SURGICAL TREATMENT OF DEEP BURNS AND THEIR SEQUELAE

Leningrad VESTNIK KHIRURGII in Russian No 3, 1971 pp 117-121

VIKHRIYEV, B. S., DMITRIYENKO, O. D. and KRYLOV, K. M., Department of Thermal Injuries (in charge Prof B. S. Vikhriyev), Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] In spite of the existence of a large number of sources dealing with autotransfusion, the authors claim to be the first to apply it to the surgical treatment of burns. The application of autotransfusion to 74 cases of burns is described, the need for donor transfusions being frequently ruled out in such cases. It is indicated that autotransfusion can and should be used, instead of transfused donor blood, in the surgical treatment and reconstructive surgery of many burn patients. Figure 1; references 4 (Russian).

USSR

UDC 616.85-07:616.12-008.318-02:616.8-009.836007

DYNAMICS OF CHANGES IN THE VEGETATIVE REGULATION OF CARDIAC RHYTHM DURING THE AWAKE-SLEEP CYCLE IN CASES OF NEUROSES

Moscow SOVETSKAYA MEDITSINA in Russian No 1, 1978 pp 54-57 manuscript received 19 Jan 77

VLASOV, N. A., Section of Pathology of the Vegetative Nervous System, First Moscow Medical Institute imeni Sechenov

[Abstract] The effects of various stages of sleep on the vegetative nervous system have long been studied. The works of Khatri and Freis, Pickering and others, Aserinsky, Shapiro and others, Guazzi and others, Iwamuro and others, and Kumazawa and others are briefly reviewed. A total of 104 individuals with various forms of neuroses were subjected to polygraphic studies. All subjects were given EEGs, electrooculograms, electromyograms and tested for cutaneous galvanic reactions. The international classification of sleep stages (Rechtschaffen and Kales, 1968) was used. The data on systole frequency and the magnitude of vegetative indicators were used for the analysis. A formula for determining vegetative indicators is presented. The subjects were given one of the following--elenium (10 mg 3 times daily), eunoktin (5 mg), calcium cyclobarbitol (0.2), sodium oxybutyrate (1.5g) and fenibut as well as L-triptophane (5g). The neurotic patients showed increased systole frequency, as the study progressed this was reduced in the second and third stages for those taking elenium and in the third stages for sodium oxybutyrate.

L-tryptophane produced an even greater reduction in systole frequency. The drugs reduced the vegetative indicators. The study approaches psychovegetative relationships from the perspective of the central regulation of rhythm formation. The reductions in emotional tensions were brought on by the drugs and the reduced systole frequency. The changes in vegetative indicators and systole frequency point to permanent vegetative changes in individuals suffering from neurosis. References 14: 6 Russian, 8 Western.

USSR

UDC 616.225.2.015

SOME ISSUES CONCERNING THE PHARMACODYNAMICS OF SANEGIT, A HYPOTENSIVE AGENT

Moscow SOVETSKAYA MEDITSINA in Russian No 1, 1978 pp 86-90 manuscript received 26 Apr 77

TSOY, A. N., TURASHVILI, G. A., SHTITEL'MAN, L. B., and FEDOROV, YE. A.,  
Section of Clinical Pharmacology, Chair of Propadeutic Therapy of the  
Second Therapeutic Faculty, First Moscow Medical Institute imeni I. M.  
Sechenov

[Abstract] Sanegit (2 guanidino-methyl-1-monoazacyclooctane sulphate, or guanidinomethyl-heptamethylenimine sulphate) was synthesized in Hungary and differs from sanotenzine. Its therapeutic effect is compared to isobarine for 60 individuals suffering from the second stage of hypertension. The average dose was 50 mg (ranging from 10 to 100). Treatment lasted from 10 days to 3 months. Oral dosage had a 80% success rate (55% was good and 25% satisfactory). Systolic pressure was reduced an average of  $25 \pm 10$  (r less than 0.05) and diastolic by an average of  $12 \pm 2$  (r greater than 0.05). Twenty-one patients suffering from hypertensive crises were given intravenous doses and after the hypotensive results were obtained, were given oral doses. Arterial pressure decreased after 2-10 minutes, reaching a minimum at 45-50 minutes and gradually rising over 2-3 hours. The effects of sanegit are similar to isobarin. Orthostatic hypotension was observed for both; it was more pronounced for isobarin. General peripheral resistance was reduced by 13% and minute blood volume by 10.1%. Pulse wave propagation was reduced by 19.6%. Side effects were noted in 18 patients, general muscular weakness and orthostatic reaction in 5, a feeling of heat in 7 and intensified headaches in 3. Sanegit is effective in treating the second stage of hypertension. In cases where it had no effect it was used in combination with dichlorothiazide. Figures 3; references 16: 9 Russian, 7 Western.

3  
Publications

USSR

UDC 577.391:019.941

IONIZING RADIATION AND IMMUNITY

Moscow RADIOBIOLOGIYA in Russian No 2, 1978 pp 316-317

[Review of book "Ioniziruyushchiye Izlucheniya i Immunitet" by V. M. Shubik, Moscow, Atomizdat, 1977, 147 pp]

KLEMPARSKAYA, N. N. [Reviewer]

[Abstract] The book under review is divided into three sections covering recent data on the effects of various forms of external radiation on immunity, the effects of internally administered isotopes, and a comparison between the effects of these two forms of irradiation. The author cites 296 Soviet and non-Soviet references and employs 33 tables and 19 figures to present his views. Of great interest are the data the author presents on the induction of auto-immune processes in various forms of irradiation, with much of the information derived from the author's personal research. The author fails to cover certain aspects of autoallergy, but on the whole the work will be highly useful to radiobiologists and radioimmunologists.

CSO: 1840

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